# COAL AGE

AUGUST 1960
PRICE $1

A McGRAW-HILL PUBLICATION

New force in coal marketing field — To match postwar gains in productivity, UMWA moves to build markets for coal

Punch mining: how Lorado works it — Mobile loaders with shuttle cars and belts recover 68-in coal after auger development

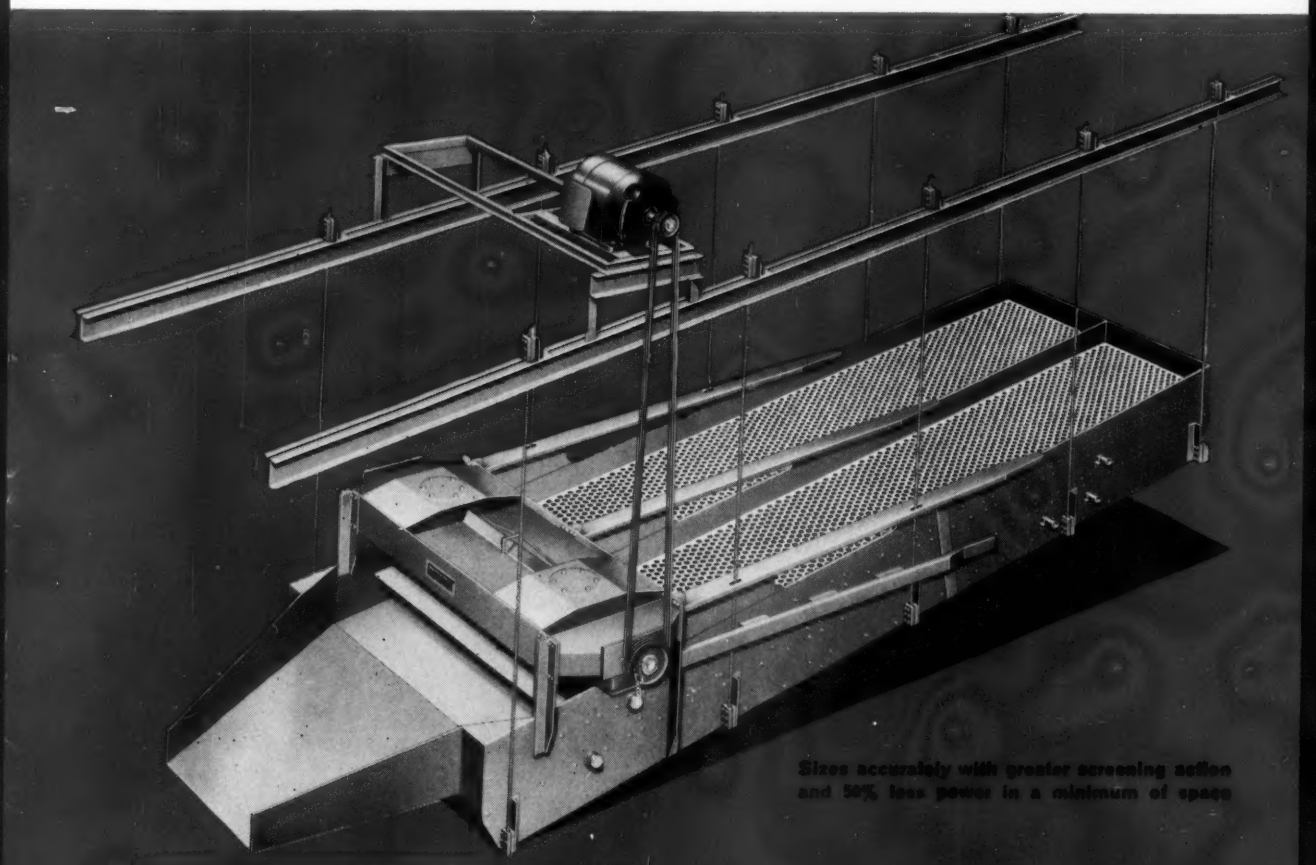
Haven when needed: permanent-type barricades — Vacant mine substations with boreholes provide emergency refuges at a minimum cost

Draglines set stripping pace — Two draglines key versatile plan for one or two seams and burdens to 60 ft with or without shooting

Mathies coal-mine railroading — Recipe for the best in track at the lowest cost: all-welded 85-lb rail, treated ties, mechanical tamping, grades under 2%

Improved rock-dusting — Air fluidizing raises application rate 4 to 5 times per man-hour; bulk handling tops off the savings

*SAVES SPACE—SAVES POWER—SAVES MAINTENANCE*




**FAIRMONT**

# SHAKER SCREEN

WITH INTEGRAL DRIVE

**FOR COAL • GRAVEL • RUBBLE • CRUSHED STONE • ORES • AND OTHER BULK SOLIDS**

Here's the screen that's the last word in efficiency and economy—space saving, power saving, structural maintenance saving—yes, even saving wear and tear on the facility where it is housed!

Its integral drive saves space by eliminating drive arms! Its screen and drive suspended by wire rope keeps the reciprocating forces from transferring destructive impact and vibration to the structure, preserving building life and reducing upkeep! What's more, the FAIRMONT Shaker Screen operates with 50% less power than most other standard units and, all-in-all, saves time and maintenance day in and day out!

Why not write us about your screening problems today. We are sure this FAIRMONT Shaker Screen with its integral drive will save you dollars in your profit picture. Send for Bulletin No. 6-60 on your letterhead.

**FAIRMONT MACHINERY COMPANY**

FAIRMONT, WEST VIRGINIA

ENGINEERS • DESIGNERS • FABRICATORS and CONSTRUCTORS

# The belt with the built-in fire extinguisher

THERE'S no fuel for fire in that conveyor belt. It's a B.F.Goodrich belt made with a special fire-resisting rubber. It'll neither support combustion nor spread flame.

In those states that require ventilation stoppings if fire-resisting belts are *not* used, this B.F.Goodrich belt eliminates those costly protective walls, is saving mines thousands of dollars each year.

Besides making belts safer, this special fire-resisting rubber also has high resistance to impact, abrasion, grease, tearing, cutting, gouging and the deteriorating effects of mildew. This means BFG fire-resisting belts can be expected to equal, or surpass, the long service records made by other B.F.Goodrich Caricoal belts in underground mines.

And notice the natural troughing. The use of Nyfil fabrics makes this a more flexible belt, able to carry coal at high speed without spilling a lot of it along the way. Makes it an ideal belt for a rope conveyor.

Next time you're considering a conveyor belt purchase, look into the safety and other cost-cutting advantages you can get with BFG fire-resisting belts. They've been accepted for listing as fire-resistant by the Bureau of Mines (Acceptance No. 28-6). Your B.F.Goodrich distributor can tell you more, or write the *B.F.Goodrich Industrial Products Company, Department M-860, Akron 18, Ohio.*

**B.F.Goodrich**

**CONVEYOR BELTS**

# Announcing 3 NEW CARMET Mine-Tested Cutter Bits

Here's a trio of precision-made cutter bits, proven in operation to give long service under tough mining conditions. Your Carmet distributor carries them, and cutter bits for every mining operation, in stock. Check with him now.

## Carmet JC Style Colmol and Boring Bit

Note the collar support that prevents bit block from splitting. Shank is forged from high-alloy heat-treated steel. Tough, hard, wear-resistant carbide tip is double-bonded by mechanical cap. Long operating life under all conditions.

## Carmet JR Style Cylindrical Bit

Another new outstanding Carmet bit for use on all cutting machines and continuous miners. Tip is embossed in high alloy heat-treated steel.

## Carmet GV Style Bit for Joy Cutter Chain

Designed with husky bull-neck for use on Joy GV-6111 cutter chain. Style GVR has drilled carbide insert brazed into shank for maximum support. GV series available with double-bonded insert brazed to milled shank.

**New Carmet Mining Tool Catalog Now Available From Your Carmet Distributor**

Brace-Mueller-Huntley, Incorporated
Offices: Buffalo, Rochester & Syracuse, New York
Carbon Transfer & Supply Co., Helper, Utah
Carlsbad Supply Company, Carlsbad, New Mexico
Consolidated Supply Co., Picher, Oklahoma
Crandall Engineering Co., Inc., Birmingham, Alabama
Gladstein Company, McAlester, Oklahoma
Marion Mine & Mill Supply Co., Whitewell, Tennessee
McCombs Supply Company, Jellico, Tennessee
McCombs Supply Company, Harlan, Kentucky
Oglebay, Norton Mine Supply Division
Offices: St. Clairsville, Ohio & Johnstown, Pa.
Persinger Supply Company, Williamson, West Virginia
Persinger's Inc., Charleston, West Virginia
Union Supply Company, Denver, Colorado
U.S. Steel Supply Company, Pittsburgh, Pennsylvania
W.B. Thompson Company, Iron Mountain, Michigan
Vanguard Equipment & Supply, Chicago, Illinois
C. F. Gharst Supply Co., Terra Haute, Indiana
Bluefield Hardware Co., Bluefield, West Virginia

Revised 5th edition contains application data and specs on full Carmet Mining Tool line, including sections on grinding and reconditioning. For your copy, see your distributor or write Carmet Division, Allegheny Ludlum Steel Corp., Detroit 20, Michigan.

ADDRESS DEPT. "A-8

WSW 7391

CARMET

CEMENTED CARBIDE DIVISION OF
ALLEGHENY LUDLUM STEEL CORPORATION

## NOW! A SCREEN WITH A

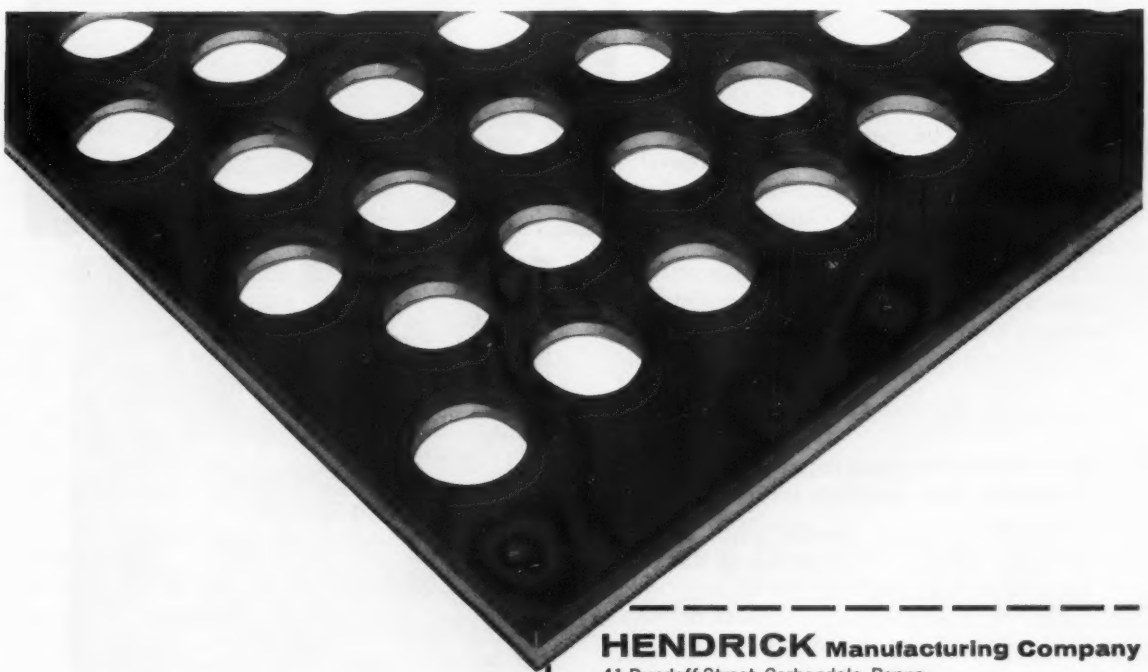
# rubber bumper

HENDRICK RUBBER CLAD PERFORATED METAL is now available with a specially designed rubber covering. Ideal where extreme abrasion is a problem, rubber clad Hendrick Perforated Screens assure far less plate wear. Large chunks of ore, coal or stone hit the screen with a fully cushioned shock... the rubber coating also takes the brunt of wear by protecting the steel plate underneath. The rubber laminate is bonded to steel by a new adhesive and vulcanized under controlled heat.

For more details contact your local Hendrick representative or mail in the coupon direct.

**HENDRICK Manufacturing Company**
**Carbondale, Pennsylvania**

PERFORATED METAL SCREENS • WEDGE WIRE SCREENS • CASCADE WEDGE WIRE SCREENS
WEDGE SLOT SCREENS • RUBBER CLAD PERFORATED SCREENS • FLANGED LIP SCREENS
FLIGHTS • SHAKER AND CONVEYOR TROUGHS.



**HENDRICK Manufacturing Company**
41 Dundaff Street, Carbondale, Penna.

Gentlemen: I would like to learn more about Hendrick Rubber Clad Perforated Metal Screens.

☐ Please have representative call.
☐ Please send FREE literature.

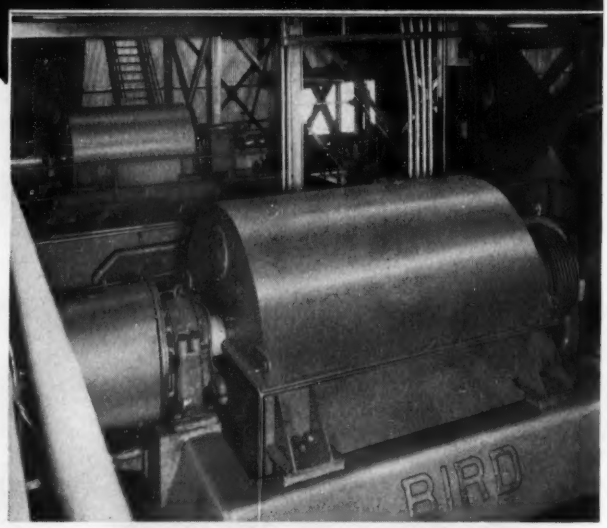
NAME_____ TITLE_____

COMPANY_____

STREET_____

CITY_____ STATE_____

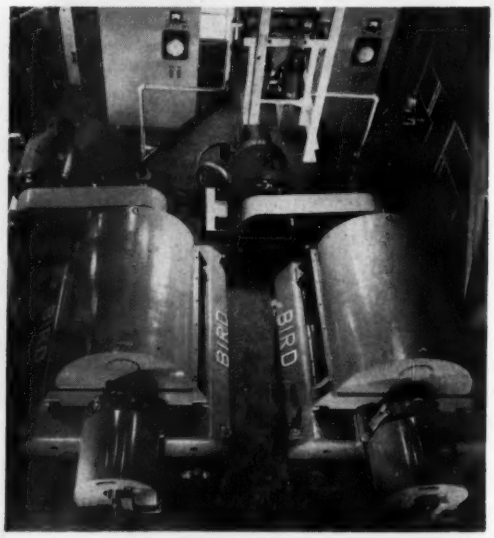
# You can feed this BIRD right from the table...




The Bird Solid Bowl Coal Centrifugal takes its feed direct from the wet tables without prethickening or screening. The entire fine coal cleaning circuit consists of nothing more than tables and Birds. You can't beat this for simplicity, compactness, minimum maintenance and minimum operating attention.

The Bird can be operated so as to throw out high ash slimes with the effluent, if desired. The coal is as dry as can be obtained by any mechanical means. Coal recovery is close to 100%.

The Bird runs month in and month out without supervision. Overall cost including write-off is only a few cents per ton.




**USE IT TO DRY THE FINES FROM FLOTATION CONCENTRATES AND CYCLONE UNDERFLOWS, TOO**

The Bird employs powerful centrifugal force to wring maximum moisture out of these fines. Thermal drying cost is minimized.

For the complete story on either or both of these money-saving applications, write

**BIRD**
**MACHINE COMPANY**

SOUTH WALPOLE, MASSACHUSETTS
Regional Offices:
EVANSTON, ILL. · ATLANTA, GA. · HUNTINGTON, W. VA.
LA PORTE, TEXAS · ALAMO, CALIF.

# This Month in COAL AGE

AUGUST, 1960

**Features This Month:**


Editorials: Basically Favorable; The Ultimate . . p 69
UMWA: New Force for Coal Marketing Progress . p 70
Punch Mining: How It Works for Lorado Coal . . . p 74
Permanent Barricades Provide Emergency Havens p 84
Draglines Pace Flexible Thin-Seam Stripping . . . . p 88
Underground Railroading at Mathies . . . . . p 92
Better Rock-Dusting Cheaper . . . . . p 104
Rocky Mountain Coal Mining Institute Meets . . . . p 110


**Departments This Month:**


Coal Commentator p 11 — News Roundup . . . p 26
Foremen's Forum . p 116 — Operating Ideas . . p 120
Equipment Developments . . . p 124


## ► Labor Relations

*UMWA: New Force for Coal Marketing Progress* . . . . . *p 70*

**W. A. Raleigh Jr.,** Associate Editor, *Coal Age*

Within the past 5 yr and in another pioneering union activity, John L. Lewis has launched a research and marketing program for the United Mine Workers of America. To formalize the program, he set up UMWA's Research and Marketing Dept. in April, 1957. Under the leadership of Michael F. Widman Jr., the department has moved substantially and effectively into marketing operations by conducting special promotion projects, by establishing closer liaison with other industry groups on competitive matters, and by acting as a clearing house for research ideas. The ultimate goal: To match postwar gains in productivity with equivalent gains in marketing.

**Headliner**—Photo-panel shows four major milestones in developing UMWA's research and marketing program.

## ► Deep Mining

*Punch Mining: How It Works for Lorado Coal* . . . . . *p 74*

Using conventional face equipment with Airdox coal-breaking and ropeframe belt-conveyor transportation, 8-man crews can produce 486 tons, clean coal, at 80% efficiency from the 68-in Upper Chilton seam. Large measure of credit for this performance goes to industrial-engineering effort which backs up the job. Surface facilities, including substations, compressor stations, offices, belt heads and supply house are portable to simplify moves along the highwall.

**The Recipe**—Step-by-step account of layout, methods and subsequent coal handling and preparation.

## ► Underground Safety

*Permanent Barricades Provide Emergency Havens* . . . . . *p 84*

**Vance Price,** General Superintendent, Eastern Coal Corp., Stone, Ky.

Wheeler barricade at Eastern Coal Corp.'s No. 4 mine is centrally located to four working sections to provide reassurance and safety for workmen. The barricades are erected in vacant substations having borehole access to the surface. Compressed air from the surface is available to pressurize the refuge area, thus preventing inflow of smoke or gases. Additional barricades are under construction within Self-Rescuer distance of other working sections.

**Story-in-a-nutshell**—Diagram showing how barricades are constructed.

## ► Stripping

*Draglines Pace Flexible Thin-Seam Stripping* . . . . . *p 88*

Big bulldozers teamed with 12- and 6-yd draglines in two pits provide maximum flexibility in stripping at the Copperhead Coal Co., Sugar Creek, Ohio. Most of the company's production comes from the Ohio No. 5 seam but mining becomes a two-seam operation in the higher hills where the No. 6 seam outcrops. Stripping


COAL AGE, August, 1960, Vol. 65, No. 8. Published monthly by McGraw-Hill Publishing Co., Inc. U. S. subscription rate for individuals in the field of the publication $3 per year, single copies $1 (for rates elsewhere see p 9). **Executive, Editorial, Circulation and Advertising offices:** McGraw-Hill Building, 330 W. 42d St., New York 36, N. Y. Printed in Philadelphia, Pa.; second-class mail postage paid at Philadelphia, Pa.

**Postmaster:** Please send form 3579 to Fulfillment Manager, Coal Age, 330 W. 42d St., New York 36, N. Y.

# Galis Facemaster DRILL

## Fast, fast positioning - Most profits!

The new **Galis Facemaster Drill** has all and more of the money making features of the Roof-Master which took the coal industry by storm. Literally more than a hundred were sold before we realized it.

And now comes the latest perfected 24" permissible face drill by Galis.

Auger stays level during lift.

Auger stays perpendicular to face during swing.

Auger can be rotated 90° cw and 90° ccw, from longitudinal position.

All hydraulic.

Greatest flexibility in drilling for cross cuts.

Minimum of repositioning auger for next hole.

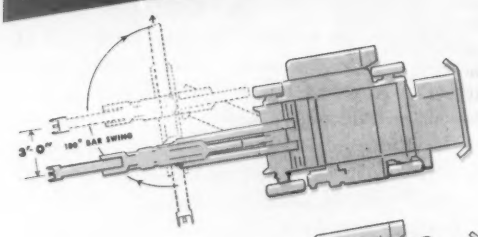
Drill guides readily changed for accommodating auger diameters.

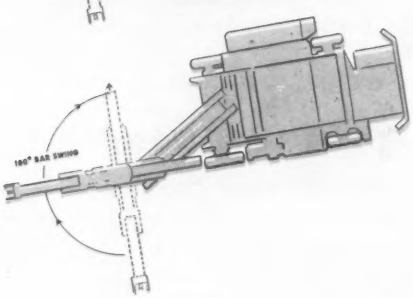
20 HP Motor.

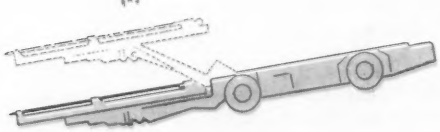
One man operation.

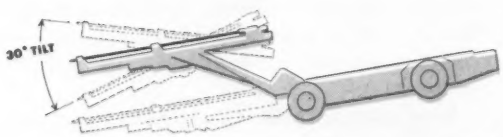
One hand control for tramming and steering.

*Majority of parts interchangeable with Galis Roof-master Drills.*






**Galis**
ELECTRIC & MACHINE CO.
MORGANTOWN, W. VA.

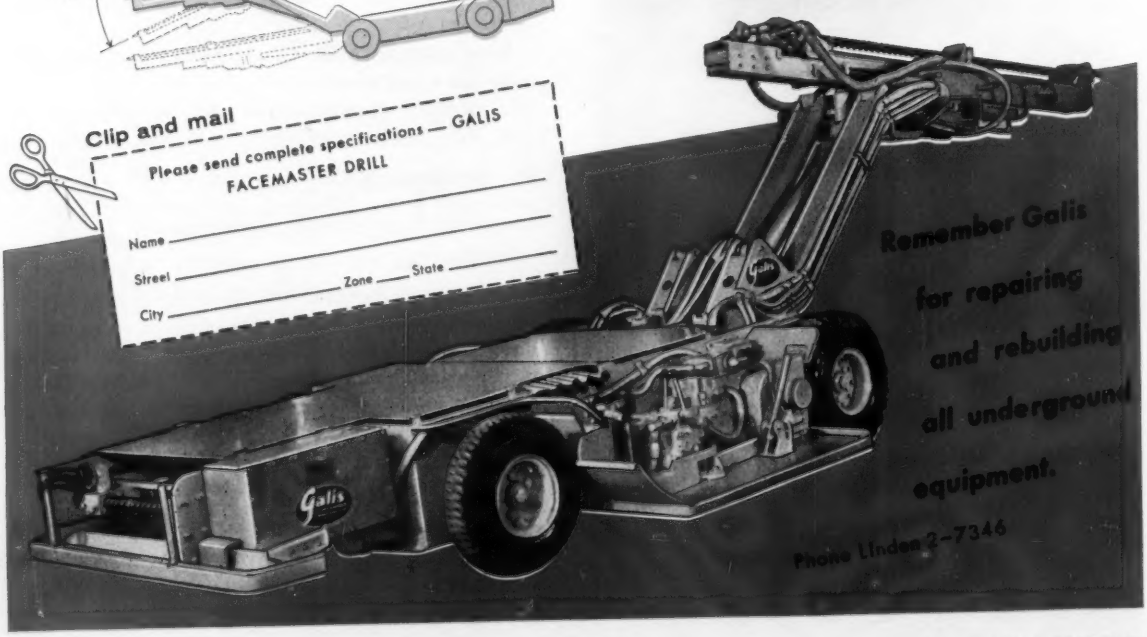
**Clip and mail**

Please send complete specifications — GALIS FACEMASTER DRILL

Name _____

Street _____

City _____ Zone ____ State ____

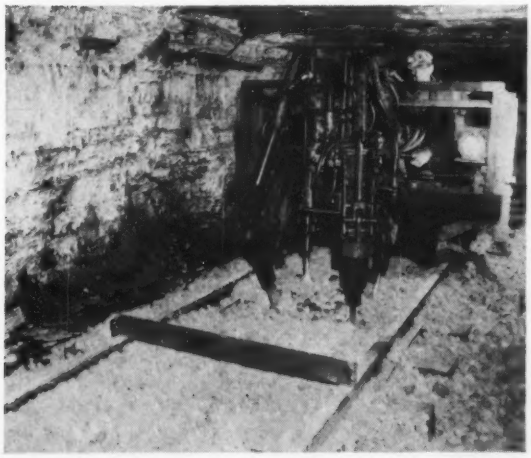



**Remember Galis for repairing and rebuilding all underground equipment.**

Phone Linden 2-7346

units remove overburden on the top seam without the aid of explosives but nitrate-oil mixture is required to break material on lower seam. Both draglines employ key-cut system of handling overburden. Five 20-ton end-dump semitrailers, loaded by 3½- and 2½-yd shovels, carry coal 4 mi to tipple.

**Of Prime Interest**—Drilling and charging methods; details of key-cut stripping.



## ► Rail Haulage

*Underground Railroading at Mathies* . . . . p 92

Application of labor-saving methods, including a mechanical track tamper and an improved method of welding rails, plus rigid standards for initial installation enable six men to handle installation and servicing of track at Mathies Coal Co., Finleyville, Pa. The Mathies system now has 54 mi of track and handles 18,000 tpd in three-shift operation. Big 50-ton locomotives pull 50-car trips to the surface at speeds up to 20 mph. Using the mechanical tamper, two men have tamped 209 ties, or 418 ft of track, in 263.36 min. And the simplified welding process makes it possible for two men to make 10 joints per shift.

**Highlights**—How two men lay 85-lb track; descriptions of the mechanical tamper and simplified rail welding system; how rail washers, bent-axle detectors, a defective-wheel detector and flange oilers contribute to better haulage.

## ► Rock-Dusting

*Better Rock-Dusting Cheaper* . . . . . p 104

**C. William Parisi,** Pittsburgh Coal Co., and

**G. L. Alston,** Mine Safety Appliances Co.

Using a new face duster employing air fluidization to move the dust, one mine increased the rate of appli-

# This Month in COAL

**STILL DRIFTING—Though power output and automobile production have done well so far in 1960 other components in the U.S. economy—particularly steel—have not. As a result business is still drifting sluggishly along with no immediate prospects of a major revival. As a further result, bituminous coal, too, continues to drift, following, in the initial postvacation weeks, roughly the 1959 pattern—down sharply from the rate before vacation.**

**Anthracite's losses continued to mount, with the rate in early postvacation weeks even greater than the 15.4% figure for the year to June 25, which in turn was substantially higher than the 9.4% loss rate for the first quarter.**

**STEEL QUESTIONS—One school of forecasters now stoutly insists that business, though not booming, is good and will remain so. Another is increasingly of the opinion that another recession is a real possibility. If this latter group should turn out to be right, steel probably will get the credit for pointing the way. Its performance in 1960 has been just the opposite of what everybody expected, and leads one to wonder if its slump is only temporary—low buying—or if it is suffering a basic contraction in demand for its products.**

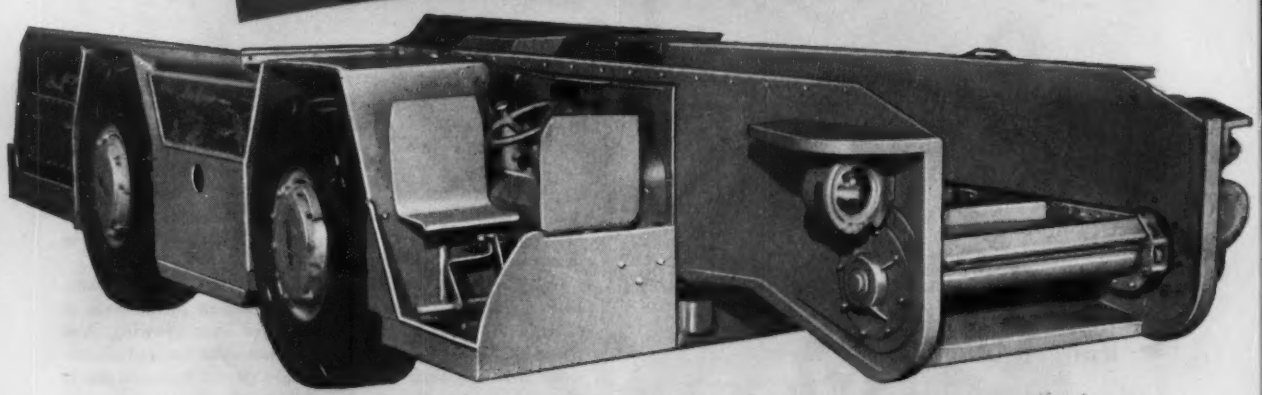
**One ground for thinking this way is the rise of the compact car. Imports, either of steel as such or in the form of automobiles and other products, have been growing. And there is the possibility of substitution—plastics and aluminum. If it was aluminum coal might be not too unhappy in view of the fact that smelting a ton of aluminum takes 7 tons or more of coal to furnish the electricity. And when you throw the coke rate into the picture there is still even more reason to believe that coal for steel may be surrounded by a number of question marks in the future, though there is no question but that it will remain a member of the "Big Three" in markets.**

**PRICE PRESSURE—The fact that a major utility has signed a fuel-oil contract under which the dealer guarantees to sell the oil at a set differential under whatever the coal price is is viewed by some as primarily another move to put pressure on the coal producers and railroads for additional price and freight concessions. Whether the movement will spread and intensify is a question. Certainly it is doubtful if enough oil could be found to make the club much more than a stick, but as long as the industry continues to operate at a low rate the more likelihood there is of attempts to get it—and the carriers—to cut below the meat into the bone.**

**CONGRESSIONAL REPRISE—It is a fact of life that when Congress is in session money is being spent. Upping the spending rate of the federal establishment will probably be the only major accomplishment of the post-convention deliberations. From the coal standpoint, passage of the research bill, continuation of basic percentage-depletion standards, and elimination of the 4-yr limitation on deduction of exploration expenditures were three major accomplishments. But the resolution for a joint committee to investigate the desirability of a national fuels policy is dead for this session.**

# STICK THIS ON YOUR CAP * . . .

# YOU'RE AHEAD BY FAR with TORKAR



## *AHEAD* in construction

TORKAR is the *unique* single-motor, torque converter shuttle car in the field—ahead in construction by every yardstick you wish to apply. Simplified power, simplified controls, only 25% of the wiring of multi-motor cars—these and many other design and engineering advances keep TORKAR always out front in construction.

## *AHEAD* in economy

Report after operating report shows TORKAR's amazing economy in service. The per-ton maintenance figures must be seen to be appreciated (we can quote many of them to you), and the over-all low cost of TORKAR operation is an industry sensation. Why not compare your own shuttle car figures? See your National Mine man for the facts.

## *AHEAD* in performance

With power applied equally to all four wheels through torque-converter and constant-mesh, 3-speed forward-and-reverse transmission, TORKAR flexibility is unequalled under all conditions of loads and grades. Maneuverability is outstandingly easy with TORKAR 4-wheel steering. The net is more work done per shift with less operator fatigue when TORKAR's on the job!

## *AHEAD* in versatility

The variations available in height, width and power make TORKARS applicable to practically any mining condition. A change from AC to DC power involves simply replacing the motor and controller, and from DC to AC replacing the motor, controller and cable reel. If a change can be foreseen initially, the car can be equipped with a combination reel and controller case suitable for either power supply.

** if you'd like a few actual protective cap reflector stickers, 3⅛"x1⅛", write us— we'll gladly oblige!*

**National Mine Service Company**

Koppers Building Pittsburgh 19, Pa.

**DISTRIBUTING DIVISIONS:**

ALABAMA DIVISION
Birmingham, Ala.

ALL-STATE DIVISION
Logan, W. Va.

ANTHRACITE DIVISION
Mt. Carmel, Pa.

BEMECO DIVISION
Beckley, W. Va.

KY.-VA. DIVISION
Jenkins, Ky.

MOUNTAINEER DIVISION
Morgantown, W. Va.

WESTERN DIVISION
Price, Utah

WESTERN KY. DIVISION
Madisonville, Ky.

WHITEMAN DIVISION
Indiana, Pa.

**MANUFACTURING DIVISIONS:**

ASHLAND DIVISION
Ashland, Ky.

CLARKSON DIVISION
Nashville, Ill.

GREENSBURG DIVISION
Greensburg, Pa.

**IN CANADA:**

NATIONAL MINE SERVICE (CANADA) LIMITED, Elliot Lake, Ontario

cation from 0.43 to 1.88 tph. The new machine holds 3,200 lb of dust and is capable of discharging it at approximately 600 lb per min. It is, like the older units, carried in a shuttle car.

Bulk handling of rock dust, also employing the fluidizing principle, has the initial advantage of a cost reduction of $1.50 to $2.00 per ton as a result of buying in bulk. Tank cars with capacities up to 15 tons will move dust to the face areas either directly from the railroad cars or trucks, or from storage bins or boreholes.

**Ultimate Aim**—A cut of 50% or more in the cost of applying rock dust.

---

D. C. McGRAW Jr., Publisher IVAN A. GIVEN, Editor

Harold Davis, Managing Editor; A. E. Flowers, Associate Editor; W. A. Raleigh Jr., Associate Editor

Daniel Jackson Jr., Associate Editor; Richard J. Taft, Assistant Editor; F. A. Zimmerli, Art Director

G. B. Bryant Jr., Washington; W. H. McNeal, Circulation Manager

GORDON A. MACK, Advertising Sales Manager

**NEWS BUREAU OFFICES:** Atlanta; Chicago; Cleveland; Dallas; Detroit; Los Angeles; San Francisco; Seattle; Washington

**WORLD NEWS OFFICES:** London; Paris; Tokyo; Caracas; Moscow; Bonn; Mexico City; Beirut; Rio de Janeiro

COAL AGE, VOLUME 65 AUGUST, 1960, NUMBER 8

**COAL AGE**, with which are consolidated The Colliery Engineer and Mines and Minerals, is published monthly by McGraw-Hill Publishing Co., Inc. Founder: James H. McGraw (1860-1948).

**SUBSCRIPTION PRICE:** Available only by paid subscription. Publisher reserves the right to refuse nonqualified subscriptions. Subscriptions to Coal Age solicited only from executives, management, engineering, operating and supervisory officials associated with companies engaged in the mining and preparation of anthracite, bituminous and lignite coal. POSITION AND COMPANY CONNECTION MUST BE INDICATED ON SUBSCRIPTION ORDERS. Send to address shown in the box below. U. S. and possessions and Canada, subscription rate for individual in the field of the publication $3 per year, single copies $1; elsewhere $15 per year, payable in advance; single copies $2.

**EXECUTIVE, EDITORIAL, CIRCULATION and ADVERTISING OFFICES:** McGraw-Hill Building, 330 West 42d Street, New York 36, N. Y. Telephone: Longacre 4-3000. Teletype: TWX N. Y. 1-1636. Cable address: McGRAW-HILL, N. Y.

Audit Bureau of Circulations

Associated Business Publications

Printed in Philadelphia, Pa.; second class mail postage paid at Philadelphia, Pa. Title ® registered in U. S. Patent Office. © Copyrighted 1960 by McGraw-Hill Publishing Co., Inc. Quotations on bulk reprints of articles available on request. All rights reserved, including the right to reproduce the contents of this publication, either in whole or in part.

**OFFICERS OF THE PUBLICATIONS DIVISION:** Nelson L. Bond, President; Shelton Fisher, Wallace F. Traendly, Senior Vice Presidents; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator.

**OFFICERS OF THE CORPORATION:** Donald C. McGraw, President; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary.

**UNCONDITIONAL GUARANTEE:** Our primary aim is to provide subscribers with a useful and valuable publication. Your comments and suggestions for improvement are encouraged and will be most welcome. The publisher, upon written request, agrees to refund the part of the subscription price applying to the remaining unfilled portion of the subscription if editorial service is unsatisfactory. COAL AGE articles are indexed by Engineering Index. Coal Age's own index is published annually in the December issue.

**POSTMASTER:** Please send Form 3579 to Fulfillment Manager, Coal Age, 330 W. 42d St., New York 36, N. Y.

SUBSCRIBERS: Please address all correspondence, change of address notices, subscription orders or complaints to Fulfillment Manager, Coal Age, 330 West 42d St., New York 36, N. Y. Change of address notices should be sent promptly; provide old as well as new address; include postal zone number, if any. If possible, attach address label from recent issue. Copies of publication are addressed one to two issues in advance; therefore please allow one month for change of address to become effective.

# This Month in Mining Practice

**BITTING TECHNIQUE**—Field investigation and experience perhaps may be leading to a new concept in bitting-up boring-type continuous miners. Originally the idea was to keep the number of bits and holders to a minimum, in turn usually leading to big bits and big holders. Now, in direct contrast, and following practice in augering and big-hole vertical drilling, individual bit holders are merged into complete circles. Smaller bits are used and they are set as close together as possible. So far the advantages seem to be a major reduction in bit cost with faster cutting. A by-product is easy cutting through rock and sulphur.

**DRILLS AND PRIMERS**—Sidewall drilling in strip pits has long been hampered by the need to stop and insert auger sections. Moves to cut down these interruptions have included use of longer sections and, more recently, a design involving a rotating storage rack and quick-change hydraulic facilities for inserting or removing sections. One man is drilling an average of 1,000 ft per day with the latter unit.

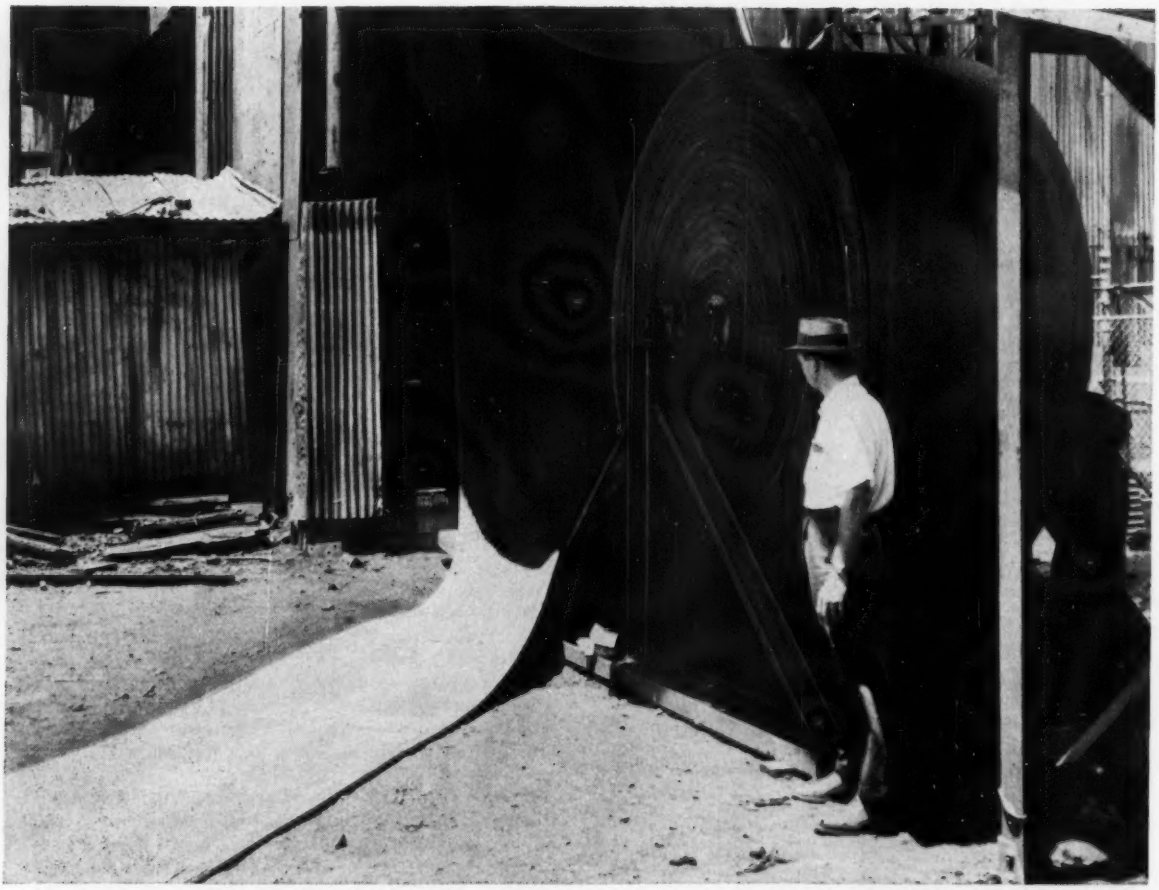
In shooting, almost every day brings a new idea for improving results with AN-fuel oil mixtures. Now a new primer-initiator is said to be providing the advantages of positive action, lower cost and comparative insensitivity, thus materially reducing the primer hazard.

**HYDRAULIC FLUIDS**—With two of the new nonflammable hydraulic fluids now officially approved and others expected shortly, the pressure to get them used is being stepped up by the Bureau of Mines and state safety agencies. Some of the pain has been taken out of the changeover by improvements in the fluids and a sharp reduction in price for many. Though the fluids are not yet completely out of the woods, they are now practicable and economical, and will become more so in the near future.

**DUAL-USE MAN CARS**—Work is now being done on the development of man cars that can run on the track to the working section, and then can operate on rubber tires to the face. The first experimental unit is scheduled for early field test. If things go as they usually do in coal mining, the test will lead to improvements, and the industry may look forward to a solution to one of its annoying and somewhat expensive problems—that of either installing two types of equipment or paying for some unnecessary walking.

**BOLTING PROGRESS**—A steady increase in the number of improvements in drills, bits and accessories, including, for example, a percussion auxiliary for use on rotary drills, continues to mark progress in roof-bolting. This progress is needed, since roof falls still are the industry's major hazard. This fact is reflected in the further fact that bituminous has made only minor progress in cutting its injury and fatality rates so far in 1960. Eliminating the 1959 disaster, the picture is much the same for anthracite. New emphasis on safety apparently is going to be needed to start the injury curve downward again.

US RUBBER CONVEYOR BELT



# OFF WITH THE OLD, ON WITH THE NEW

## 20-year "U.S." veteran makes way for new "U.S." Belt

Here's why: This was a "Haul of Fame" slope belt in performance—every foot of the way. Installed in Sahara Coal Company's Mine No. 5 (Harrisburg, Ill.) over 20 years ago, this U. S. Matchless® 54" slope belt was replaced by a new U. S. Matchless.

In the 20 years, the old belt carried over 13 million tons of raw coal, plus well over a million tons of rock.

This enviable record is typical of the kind of service obtained with U. S. Conveyor Belts. The Sahara Coal Company pioneered with U. S. Rubber in the design and installation of both slope and underground belts to deliver lowest ton-per-dollar and not a belt at-a-price.

• • •

**When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.**

US RUBBER Mechanical Goods Division

**United States Rubber**

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

# The Coal Commentator

## Business Builders

Merchandising in its fullest sense involves a wide array of steps to get and hold business beyond advertising and making calls.

**One of the steps beyond the routine is renting equipment to insure that your product gets the order and the re-orders. It is an old and sound practice, and is now being adopted by coal.** In the East, the anthracite industry has announced a plan to rent boiler plants to apartment houses, schools and other public and commercial buildings. And in the Northwest the Upper Lakes Coal Docks Bureau is subsidizing part of the cost of a modern stoker installation for a Minneapolis school. At stake is a number of such schools scheduled for modernization.

**Where it can be done, this method of promoting coal use guarantees retention of the business and if the equipment goes in on lease, there is a possibility of a little profit there, too.**

## 50 Years of Service

**On July 1 the U.S. Bureau of Mines passed its 50th birthday. As one surveys the history of its contributions to mining and other activities in the Nation the conclusion is that it has worked as effectively as any government agency on record in discharging its statutory obligations.**

It is difficult to conceive how the cause of mining safety could have been advanced to the degree that it has without such an agency. Its organization was inevitable and perhaps the surprising thing was that it didn't come earlier than 1910. And with its safety and health work the bureau has contributed significantly to industry progress through mining, preparation and utilization research. As its present director, M. J. Ankeny, puts it:

**"With 50 yr of experience as a guide, the bureau hopes in the half century ahead to strengthen further the mineral-resource base upon which the industrial progress and economic security of the United States depend."**

## Still Needed

**Diesels in tunnels, diesels in underground quarries and metal mines—in fact, diesels practically everywhere but underground in coal mines in the United States.** When this picture will change still is a question, but as time goes on the need for some form of motive power not requiring open wires continues to grow.

Perhaps the ultimate answer may be the fuel cell but for the present the alternatives include compressed air, storage batteries and the diesel engine. Now it appears that the diesel also would be particularly suitable for certain standby equipment, such as fire trucks for underground use. At present, such mobile trucks usually depend on the trolley wire, and if the wire is down or the power is off they become, with few exceptions, useless.

**The diesel is not, of course, all benefits and no disadvantages. However, as experience in coal mines everywhere but in the U.S. indicates, the benefits normally outweigh the disadvantages by a considerable margin.**

## Above and Beyond

**News that an abandoned lignite mine near Denver will be used to store natural gas leads one to wonder if coal is not being called upon for sacrifices above and beyond the normal and accustomed in facilitating the spread of this market grabber.**

The growing emphasis on storage, on the other hand, is in turn a reflection of the growing problem gas is having with prices and revenue. Rising wellhead and transmission costs are making it more imperative that the gas be put into domestic and commercial markets where the return is better. To do this storage is required to even out the peaks and valleys in demand.

**All these things add to the cost of moving gas to the ultimate consumer and push up the price at the delivery point, making it easier for coal to go in directly or in some such alternate form as electricity over a wire.**

## What Better?

**Perhaps in part because coal has increasingly agitated for consideration of the problems involved, the "energy seminar," by this and a variety of other names, is becoming increasingly popular in academic, association and other circles.** Basically, such seminars are dedicated to a discussion of future demands for energy and how they can be met, and they bring together, as a rule, representatives not only of fuel producers and distributors, but also consumers and interested government administrators and policymakers as well.

One thing must be said. Coal, in spite of some outstanding individual contributions, is not by and large taking full advantage of the opportunities these seminars provide. Consumer representatives, in particular, are there to learn and are receptive. **What better chance, therefore, for getting coal's story accepted where its impact will be the greatest? And what better opportunity for meeting the competition, hearing its story, sizing it up and laying the groundwork for meeting and beating it?**

# engine power
BY CATERPILLAR

## 25 PER CENT MORE TONNAGE AFTER REPOWERING WITH CAT

Even in these days of conveyor belts and off-highway trucks, retooling a 33-year-old railroad can be a very profitable investment. For the Material Service, Division of General Dynamics Corporation, in Lockport, Illinois, more capacity, greater savings resulted.

By replacing the power plants on five of its nine 65-ton diesel locomotives with Caterpillar D353 Diesel Engines, 11-car trains can now be hauled on round trips of 24 miles compared to only nine before repowering. Each train hauls about 550 tons of bank-run material from the pits to the processing plant, a 25 per cent increase over the old capacity. The 0.85 per cent grade with the full load offers no problems for Cat Engines.

Five trains used to be needed to maintain production compared to today's four, which meant two additional sidings for main-line passing. This kind of operation has enabled the company to pay off the power conversion in less than a year's time and given it a more profitable outlook for the future.

Here is more proof that Caterpillar Engines are your best repowering investment. Post-installation performance justifies the choice down the line. And all this comes from an investment that's only a fraction of that for purchasing new equipment to replace the entire unit.

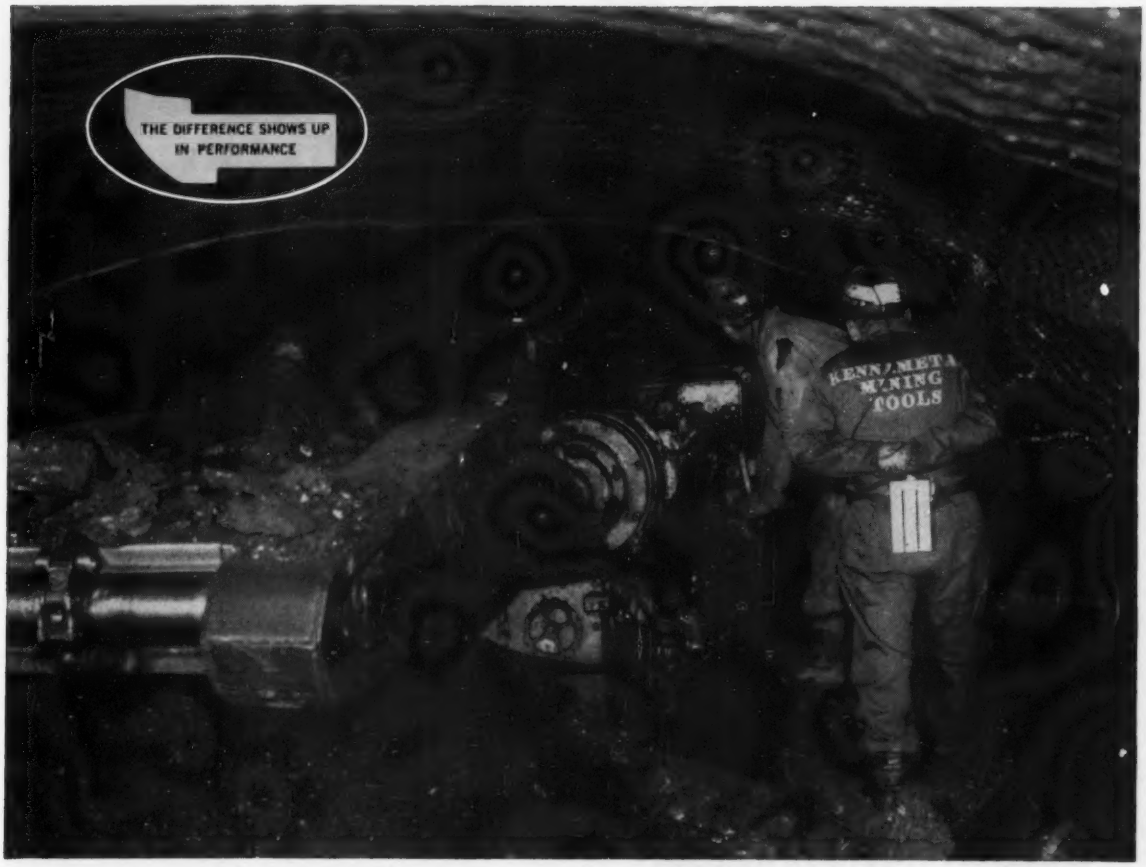
When you repower with Caterpillar Diesels, you can save several thousands of dollars on fuel alone, compared to the cost of gasoline. You save on maintenance because Cat Engines require minimum care. Service and parts are quickly available from your nearby Caterpillar Dealer.

He can help you make the right choice . . . whether you repower locomotives with a minimum investment, or purchase new equipment from the many manufacturers who insist on Cat Engines. Either way you gain the unique advantages available from Caterpillar. Ask your Caterpillar Dealer for the facts. Or write for the free booklet, "Caterpillar Engines for Railroad Power."

**CATERPILLAR**

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Engine Division, Caterpillar Tractor Co., Peoria, Illinois, U.S.A.




# Why not test Kennametal Bits in YOUR mine?

## *Just say "when"... and we'll bring the bits!*

At your convenience, we'd like to talk with you about scheduling a demonstration of Kennametal Bits in your mine.

Once arrangements are completed, a Kennametal Representative views the underground conditions at your mine and recommends the Kennametal Bit that *will* produce the most efficient results.

At the time of your choosing, Kennametal provides the bits and helps with their installation. During the demonstration, the Kennametal Representative remains at your mine to assist in every possible way. Later, he reviews the test data with you.

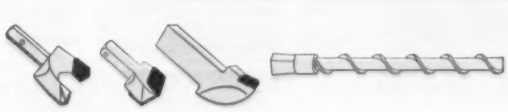
We *know* the results *will* be good. But we want you to judge for yourself. You can't compare bits on price alone . . . *the difference shows up in performance.*

Why not see for yourself? Call your Kennametal Representative or contact us direct. KENNAMETAL INC., Mining Tool Division, Bedford, Pa., Phone Bedford 755.

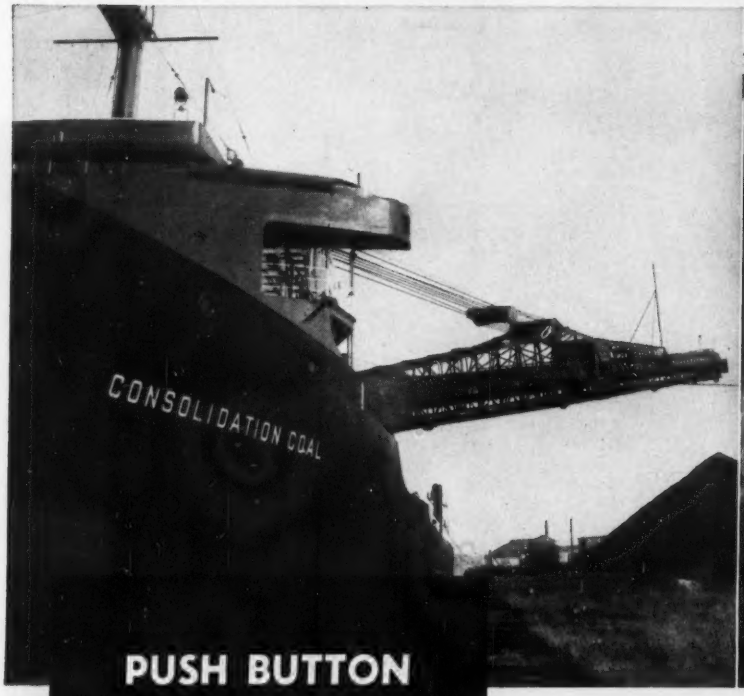
33815

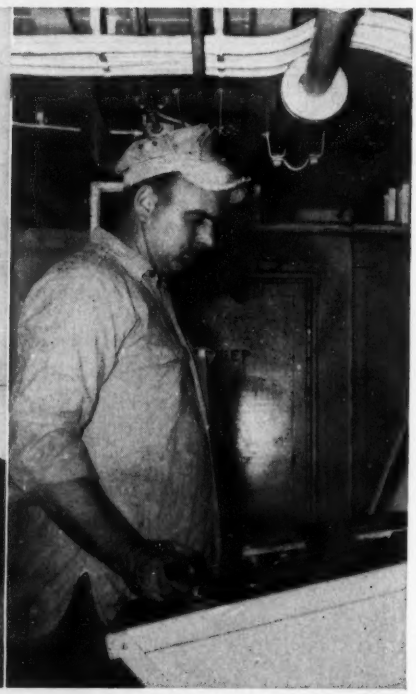
**You have nothing to lose!** This demonstration does not cost you anything extra. If the results prove favorable (and you are the judge) then you pay for the bits used. . . . If the demonstration does not favor Kennametal, you only pay for the bits at your former average bit cost. Regardless of the results . . . you pay no more than your present bit cost. Any savings we produce for you over your present average bit cost are clear profit for you.

INDUSTRY AND
**KENNAMETAL**
*...Partners in Progress*



# STEPHENS-ADAMSON



## PUSH BUTTON SIMPLICITY IN SELF-UNLOADING EQUIPMENT FOR SHIPS

In the maritime field, STEPHENS-ADAMSON engineered push-button conveyor systems are attracting widespread attention for faster ship-to-shore unloading of bulk cargoes.

Dockside time is cut to a minimum with materials being unloaded at new fast rates and at a lower cost per ton. The simplicity of S-A bulk cargo handling systems lower the boom on obsolete handling methods. More trips per season . . . more dollar profits per ship go hand in hand with the installation of an S-A high capacity continuous flow conveyor system. Write for full details today.

**S-A ENGINEERED CONVEYOR PRODUCTS FOR SELF-UNLOADING SHIP SYSTEMS**

ON THE OCEAN — S-A equipped Super Colliers unload coal at the rate of a-ton-a-second.

ON THE GREAT LAKES — S-A has pioneered many of the major advancements in self-unloading ship systems.

WRITE FOR BULLETIN 1157-B

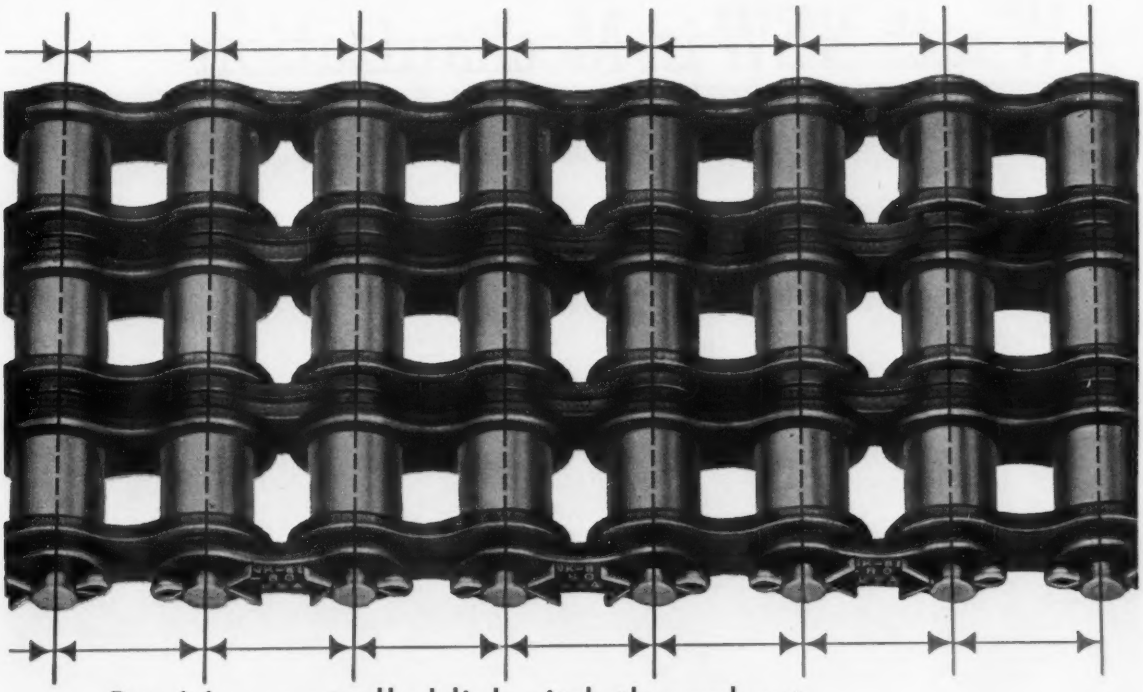
S-A
ENGINEERED BULK HANDLING SYSTEMS
MATERIALS HANDLING PRODUCTS
SPEEDWALK® PASSENGER CONVEYORS
SEALMASTER® BALL BEARING UNITS
SPHERCO® BEARINGS & ROD ENDS

**ENGINEERING DIVISION**

**STEPHENS-ADAMSON MFG. CO.**

**GENERAL OFFICE & MAIN PLANT, 55 RIDGEWAY AVENUE, AURORA, ILLINOIS**

**PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA • CLARKSDALE, MISSISSIPPI BELLEVILLE, ONTARIO**



Precision controlled link pitch throughout
LINK-BELT roller chain means

# equal length... equal strength

**How pre-stressing ensures uniform load distribution of multiple-width LINK-BELT roller chain**

Pre-stressing is one of the reasons why Link-Belt multiple-width precision steel roller chains easily handle the grueling loads common on today's drives. It seats and cold works the chain joint parts, assuring equal load distribution across the chain, minimum initial elongation, increased fatigue life.

Pre-stressing is just one of many "extras" that contribute to the *greater dynamic strength* of Link-Belt roller chain. Others include: close heat-treat control, lock-type bushings, shot-peened rollers, pitch-hole preparation. For details see Book 2657.

**PRE-STRESSING MACHINE** provides the pull that "sets" the parts of Link-Belt multiple-width roller chain. Besides assuring uniform load distribution, pre-stressing eliminates application difficulties on fixed center drives because the chain leaves the factory at precise operational length.

LINK-BELT

ROLLER CHAINS AND SPROCKETS

**BOOK 2657** has 154 pages of roller chain data. Contact your nearest Link-Belt office or authorized stock-carrying distributor. (See CHAINS in the yellow pages of your phone book.)

15,361

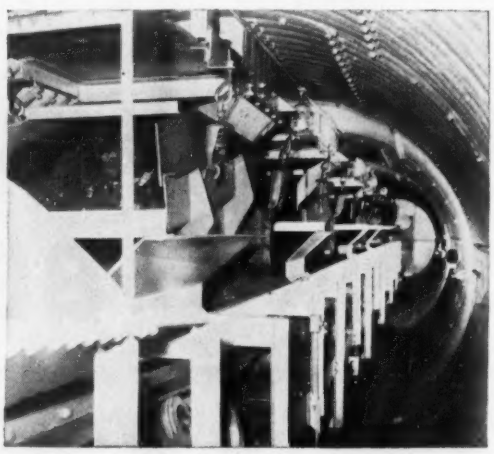
LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.

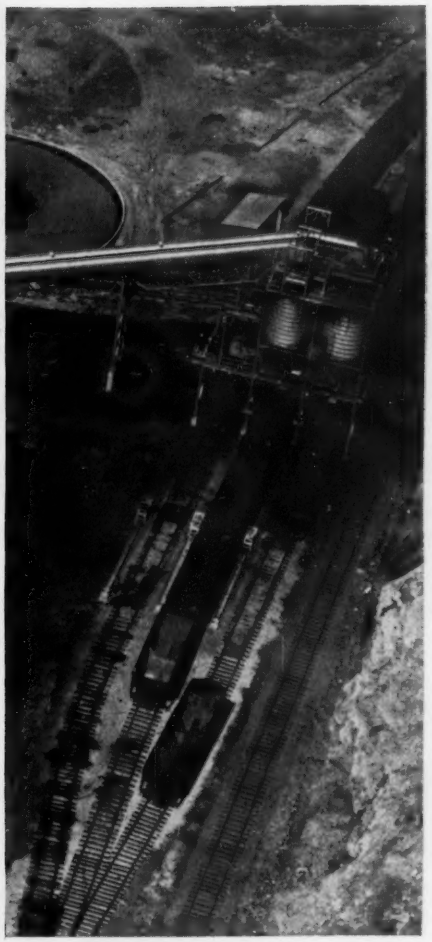
# What's NEW in Mechanization

BAUM JIGS: Here at Westmoreland Coal Company's Hampton No. 4 preparation and thermal drying plant, built by Heyl & Patterson, a Jeffrey 3-compartment jig contributes to the plant's high efficiency. A Jig provides a low-cost means of cleaning coal, separating fine and coarse sizes simultaneously, and recovering above 99.5% of coal of a specified quality.

BELT IDLERS: Tidewater Ore Docks, Pennsylvania Railroad at Philadelphia are equipped with Jeffrey PERMASEAL® belt idlers which, in 6½ years of service, have required minimum maintenance. Carrying capacity of each belt has recently been increased to 4000 tons per hour

FEEDERS: Six Jeffrey electric vibrating feeders, two under each bin, feed sized coal for blending; rates of flow can be varied to suit requirements. Any two feeders can supply needs of the entire plant. Jeffrey offers feeders in many types and capacities.





# "The complete integration of these skills can be defined as materials-handling engineering"

*Mr. Harry R. Edelman, Jr.*
*President*
*Heyl & Patterson, Inc.*
*Pittsburgh*

"As contracting engineers, we specialize in the design, fabrication and erection of bulk handling equipment. Selection and application of the proper equipment requires a knowledge of structural principles and all phases of engineering, plus the know-how regarding functioning and correlation of the equipment.

"The complete integration of these many skills can be defined as 'materials-handling engineering'... ability to design and deliver operating facilities for the handling and preparation of coal, the storage and reclaiming of iron ore, the loading and unloading of bulk materials and cargoes at river and lake."

JEFFREY considers it a compliment that, throughout the years, Heyl & Patterson have selected Jeffrey equipment for so many important jobs. Jeffrey makes jigs for grading and cleaning work, vibrating feeders, conveyor belt idlers, crushers and magnetic separators; a few typical installations are pictured here.

It pays to team up with a top flight engineering company when planning materials-handling and preparation plants. They will take undivided responsibility from design to erection, and have correct functioning of equipment constantly in mind. Their choice of equipment going into your plant is, therefore, likely to be the best... Jeffrey equipment.

## Literature will be sent to you

*Booklets are available describing Jeffrey materials-handling and preparation equipment, and Jeffrey components suitable for designing into your own systems. For copies call the nearby Jeffrey district office, or write The Jeffrey Manufacturing Company, 912 North Fourth Street, Columbus 16, Ohio.*

JEFFREY

# FIRST CHOICE

## in tough stripping operations

HIGHER ARCH · WIDER FRONT · TAPERED BASKET · GREATER STRENGTH

- GREATER work capacity
- GREATER endurance
- GREATER production at a lower cost-per-ton

4½ to 14 Cubic Yards With or Without Perforations

Hendrix DRAGLINE BUCKETS

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

NYGEN-BUILT

# GENERAL TIRES

## stay on the job 'til it's done to assure most profit per project

Built with exclusive Nygen cord, General Off-the-Road tires are the one sure way to protect and build job profits. Nygen cord construction means extra protection from costly in-the-field damage. And General's deep-digging, high flotation treads keep rolling whatever the going. From now on, be sure of less downtime, more profit . . . with Nygen-built General Tires on your units.

THE GENERAL TIRE & RUBBER CO. • AKRON 9, OHIO

# Only REPUBLIC Mine Roof Bolts Offer These 5 CERTIFIED-PERFORMANCE

### 1. PRECISION-TAPERED PLUG

Expertly engineered for proper shell expansion. Angle of taper is at the precise degree required for strength, dependability, and quick efficient tightening. Whether in relatively soft formations or other types of rock strata, improved Republic Mine Roof Bolts assure best performance.

### 2. HEAVY-DUTY SUPPORT NUT

Square nut gives over 40% better support than even the best previous method, yet maintains correct bolt tension by stripping at approximately 50 pounds torque with no damage to bolt threads. Nut can be easily applied either side up —another plus feature.

### 3. MATERIAL CONTROL CERTIFICATE

Included with every shipment of Republic Roof Bolts is a certificate stating specific physical properties of the steel used. Data provided: yield point in pounds per square inch, yield and break point in pounds, and steel heat number. No guesswork about the quality you get from Republic.

MINE ROOF BOLT MATERIAL CONTROL CERTIFICATE

*Republic Steel Corporation hereby certifies that the mine roof bolts included in mill order number _____ were made from the following steel:*

| HEAT NO. | YIELD POINT (PSI) | YIELD POINT (POUNDS) | BREAK POINT (POUNDS) |
|---|---|---|---|
| | | | |

*The above figures are correct as contained in the official records of the Corporation.*

BY _____

REPUBLIC STEEL CORPORATION
General Offices · Cleveland 1, Ohio

# FEATURES

### 4. HIGH-STRENGTH, ALL-PURPOSE EXPANSION SHELL

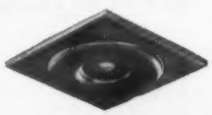
New, improved Republic RS-1 Expansion Shell is designed for effective use in any type of strata. Wide, strong leaves and flaring inside taper mean extra holding power in relatively soft formations. Narrow base supports for the leaves assure easy expansion and a wedge-like grip as the anchor is tightened.

### 5. IMPROVED SELF-CENTERING HEAD

Compact, one-piece head eliminates need for separate washer. The heavy flange and thick, reinforced washer are guided cleanly and firmly into position in the bolt plate. Entire unit is forged, for ruggedness and strength. Standard 1⅛" head available with ¼" and ⅝" bolt sizes.

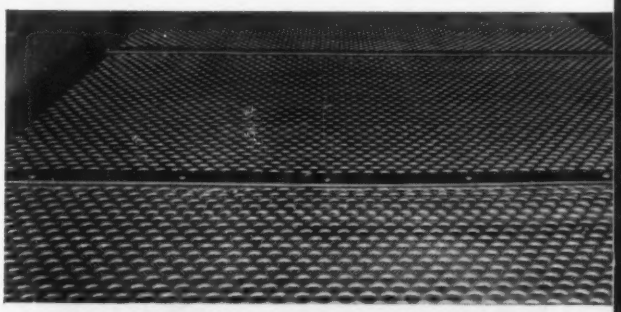
### Available Pre-Assembled to Cut Your Installation Costs

You can order your Republic Certified-Performance Roof Bolts fully assembled to save you assembly costs, prevent loss of parts and damage to bolt threads. Remember to specify Republic Roof Bolt Plates, too.



**REPUBLIC ELECTRUNITE® GROOVED-END TUBING** offers cost-saving, time-saving advantages for many mining applications. Quickly and easily joined with Victaulic Couplings, rugged Grooved-End Tubing is ideal for air, water, drainage lines, and other heavy duty operations. Can be taken up and relaid as needs change. Send coupon for more information.

**SUPERIOR STRENGTH AND CORROSION-RESISTANCE** of Republic High Strength Steel are two of the reasons it's preferred for a wide range of mine industry applications. In mine and hopper car use, for example, these factors contribute to greatly reduced maintenance. Republic High Strength Steel provides excellent impact- and abrasion-resistance, too. Mail coupon.



**SUPERIOR PERFORMANCE OF REPUBLIC ENDURO® STAINLESS STEEL** used for this cleaning plant shaker screen has drastically reduced replacement expense. Reasons: excellent resistance to abrasion and corrosion, good strength-to-weight ratio, easy cleanability, high impact strength. Readily formed and welded, Republic Stainless Steel simplifies both manufacturing and maintenance. Mail coupon.

REPUBLIC STEEL

# REPUBLIC STEEL

*World's Widest Range of Standard Steels and Steel Products*

**REPUBLIC STEEL CORPORATION**
**DEPT. CA-8909-A**
**1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO**

Please send more information on:

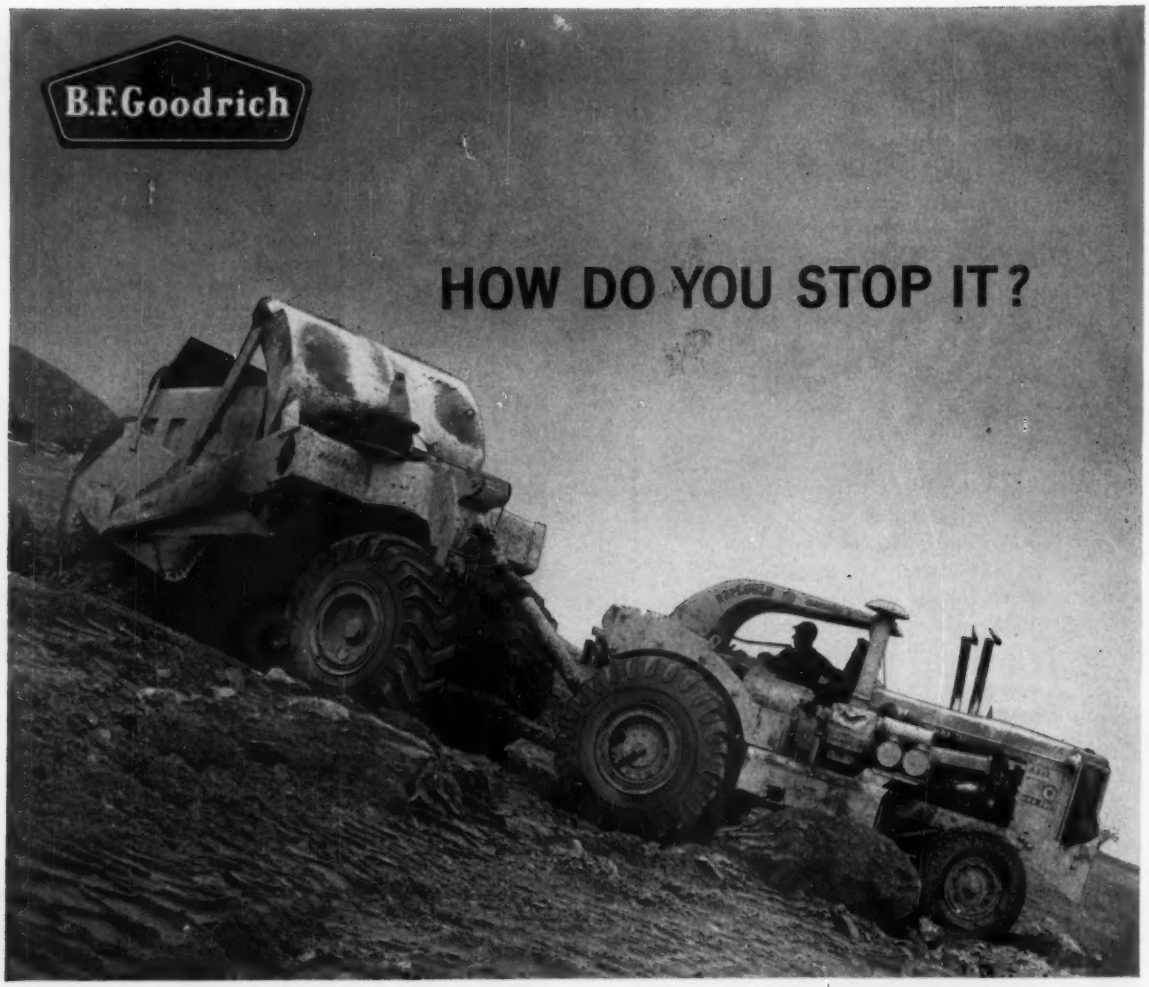
- ☐ Mine Roof Bolts
- ☐ High Strength Steel
- ☐ Stainless Steel
- ☐ ELECTRUNITE Grooved-End Tubing

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____



Hi-Torque brakes give uniform pressure, *full circle contact.* This provides maximum effective braking surface in the same size unit...double the braking power.

## HI-TORQUE BRAKES!

B.F.Goodrich Hi-Torque brakes cut stopping distance approximately in half, compared to conventional two-shoe brakes tested on identical vehicles and loads. The added safety factor with these brakes means you can haul bigger loads more safely, operate on faster cycles. More difficult off-highway jobs can be tackled.

For *double the braking power* on your heavy weight vehicles, specify Hi-Torque brakes as original equipment. These brakes are now available on heavy dump trucks, tractor-scrapers, coal haulers, mine trucks and other big vehicles, from several manufacturers.

For complete information ask the manufacturer of your equipment, or write *B.F.Goodrich Aviation Products, a division of The B.F.Goodrich Company, Dept. CA-8, Akron, Ohio.*

**B.F.Goodrich Hi-Torque brakes**

# Protect your coal and your equipment Use Morton "Formula 5" with rust inhibitor

**"Formula 5" is the safest, most effective freezeproofing compound you can buy**

Effective even at sub-zero temperatures, "Formula 5" not only keeps coal free-running for customers, it also is an ideal de-icer for tracks, switches, walks—wherever freezing presents a problem.

"Formula 5," with a new, easily distinguishable blue color, is specially made to meet the requirements set up by coal producers. And, unlike ordinary freezeproofing compounds, "Formula 5" has a rust inhibitor added to protect you and your customers against corrosion of cars, motors, conveyors and other equipment.

**"Formula 5" needs no mixing, no special handling.** For more effective, more economical freezeproofing, "Formula 5" is treated to produce an ideal dissolving rate and you just apply it dry, direct to coal. "Formula 5" won't cause costly delays by lumping or caking in feeders.

A free-flowing product, "Formula 5" is composed of chemically treated sodium chloride (30-70 mesh) and a special new improved anti-corrosive compound.

**Write for free booklet, "The Key to Low Cost Effective Freezeproofing."** If you would also like a Morton representative to assist you with freezeproofing and equipment maintenance problems, without cost or obligation, write:

**MORTON SALT COMPANY**

INDUSTRIAL DIVISION

*Dept. CE, 110 N. Wacker Drive, Chicago 6, Illinois*

**Even moving a blade-full** of shot-rock around the curve, there's no hesitation, no sluing to spill the load. The TD-25's operator has separate speed control of each track to get full-capacity performance, full time. And only the new TD-25 has the power plus of the direct-start, turbocharged DT-817 International engine—that delivers 230 high-torque hp!

# HOW POWER-STEERED, POWER-SHIFTED . . . TD-25 takes

## —on California mining operation

**Even before all the blast dust** has settled, this International TD-25 is slamming tons of shot-rock from the benches, so trucks can resume hauling to the processing plant. Then, at this gypsum mine in California, the "25" takes over the "shovel-feeding" chore—dozing full blades of rock upgrade, downgrade, and 'round the curves, to help keep the big dippers swinging full. And in between times, the "25" takes over its third tough project: benching new haul road around mountain slopes!

*Three slam-bang rock operations to handle—it's a made-to-order situation for the Planet Power-steered TD-25!*

**"Dead-track drag" eliminated!** You don't brake a track and "half-kill" your pull-power to turn, as you do with king-sized clutch-steered crawlers. With Planet Power-steering you simply change the speed of one TD-25 track—on-the-go, and with 2-finger ease! Around comes the fully-loaded TD-25—with "live" power on both tracks and both tracks pulling. Load-limiting "dead-track drag" is eliminated!

And combined, on-the-go Hi-Lo power-shifting lets you match power to load, instantly—forward or reverse. Just shift one track to high range—the other to low—to do slope-hugging, full-bite benching, or to operate straight ahead with off-center loads!

The "25" is platformed on new 7-roller tracks with double-box-beam frames. The design provides super undercarriage strength for slam-bang conditions—strength to match the full effort of the direct-start, high-torque DT-817 International Diesel engine.

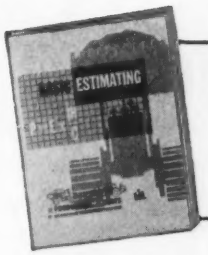
**Power-steer and power-shift the TD-25** with king-sized loads. Measure the bonus capacity you get with exclusive Planet Power-steering and Hi-Lo power-shifting. See how this control combination enables you to outearn other big rigs up to 50%. Then measure what it means to get this double-barreled advantage *only* in the TD-25—and as standard equipment *to boot!* Let your International Construction Equipment Distributor demonstrate.

International Harvester Co.
180 North Michigan Ave.
Chicago 1, Illinois

A COMPLETE POWER PACKAGE

*International*® *Construction Equipment*

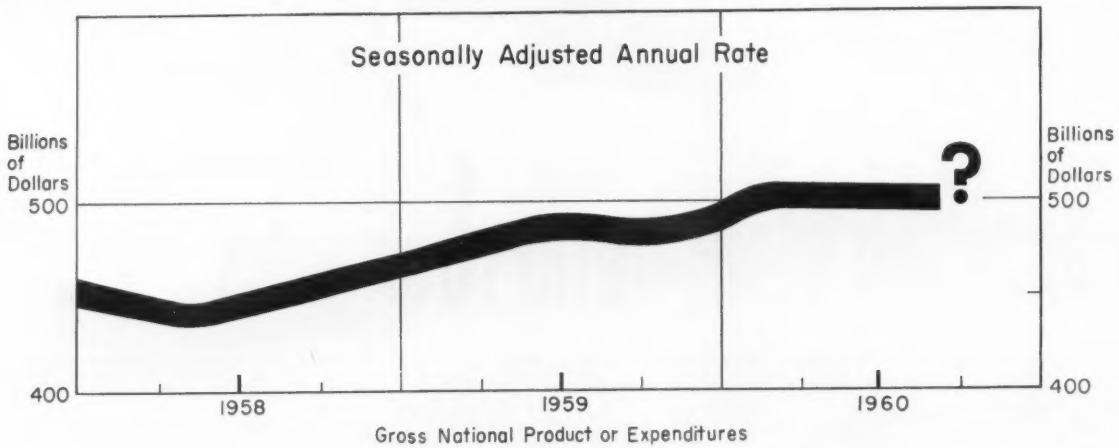
**"Boulder-dozing" after blasting—** The TD-25 does some "blasting" itself to move "big-as-a-house" hunks of rock aside. Heavy-duty TD-25 Dura-Rollers defy the rock-dozing "grind"—with the industry's thickest shells to prevent flexing—positive grit exclusion—and 1,000-hr.-interval lube capacity!




**Here's your 76-page cost and production estimating book**—newest, most authentic and complete guide for estimating material-moving costs—and for selecting equipment combinations for top profits, *anywhere!* See your International Construction Equipment Distributor!

# over three slam-bang rock jobs

# News Roundup




In 1959, a strong business year, coal ran afoul of a crippling steel strike and resigned itself to waiting for 1960 to flex its muscles. But expected gains over the 410 million tons of coal produced in '59 have so far not materialized. Troubled, but by no means losing hope . . .

## Coal Banks on a Fall Upturn

LOOK AT the heavy black line in the graph (top). It represents gross national product (GNP) and it rose steadily from a recession low point of $440 billion in the second quarter of 1958 to a little above $500 billion as of early 1960.

GNP, which tells the story of the economy's health, is basically comprised of personal expenditures, gross private investment (foreign and domestic) and government purchases of goods and services. Since reaching that half-trillion milestone in mid-1959, its rate of growth has slowed, almost stopped, and it has hovered precariously about the same level without giving a solid sign as to its next move.

Curiously, while some elements of the economy have continued to expand at a good pace, such as paperboard production or electric output, other types of business, including appliances and machine tools, have turned soft. Viewed as indicators of future business, a summation of the varied elements of the economy leaves most forecasters without solid ground to stand on.

Come September, with auto makers stepping up steel purchases for 1961 models and consumer disposable income expected to be at an all-time high, a majority of economists and businessmen are looking for an upturn. The question? How big will the upward surge be and how long will it last?

**For Coal**—This is a big question for coal men. After a disappointing 1959 marred by a long and tedious steel strike, coal was expecting a good sized gain in 1960. So far, mimicking the sluggish GNP line, coal production has merely kept pace with 1959. If tonnage is to rise to anticipated growth levels, coal seemingly will have to have a healthy expanding economy. Thus, the important **ifs** for coal are the nation's health and GNP.

**Personal Spending**—On the surface, at least, things look good. Take personal expenditures, running around $320 billion, which most analysts see as the key stimulus for an autumn upturn. Retail sales have not sagged noticeably, but neither have they been burgeoning sufficiently to cause businessmen any worry about meeting demand. If the consumer, however, does open his pockets wider, this stimulus could come, creating in turn new investment and wider employment. From this expansion would follow increased income and still another round of increased spending.

Does the consumer look ready? He does. Personal income has been rising, averaging more than $20 billion above a year ago. Trends in employment have been favorable with non-farm jobs up 1¾ million in May over a year ago. Running through the steel-strike months of last year, these gains begin to look even more impressive. However, consumer buying plans, especially for cars and houses, were scaled down between February and May, according to a recent review put out by the University of Michigan. While concern about a deep depression is "practically absent," worry about recession is relatively high, the report said. Yet, with money in the bank and in his pocket, the consumer can buy and may still buy, even the big item, the car, if he is so minded.

### In This Section


| | |
|---|---|
| People in Coal | p 32 |
| Current Coal Patents | p 40 |
| Coal Abroad | p 46 |
| Equipment Approvals | p 53 |
| Coming Meetings | p 56 |
| Mines and Companies | p 62 |
| Preparation Facilities | p 62 |
| Coal Production | p 63 |

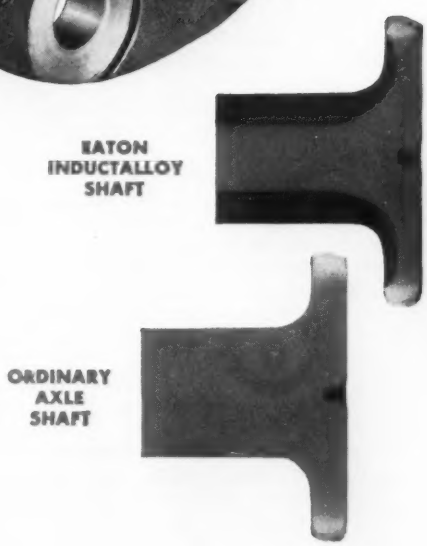
# *In New Trucks or Old—*
# EATON INDUCTALLOY AXLE SHAFTS

## LAST 3 to 10 TIMES LONGER

**Through billions of miles of heavy-duty service, Eaton Inductalloy Axle Shafts have proved their ability to deliver superior performance. Freedom from break-down—more time on the road, less time in the shop—plus thousands of trouble-free miles added to axle life, mean lower over-all operating cost.**

**Eaton's exclusive method of dual hardening truck axle shafts produces an extremely hard case extending deep into the material structure, and enables Inductalloy Axle Shafts to handle more work and abuse without fatigue failure.**

**Eaton Inductalloy Axle Shafts are available not only in new axle equipment, but also as replacements for earlier models. Ask your truck dealer for complete information.**




**EATON** — *AXLE DIVISION*
MANUFACTURING COMPANY
CLEVELAND, OHIO

**Government Spending**—The two remaining components of GNP are government expenditures and private investment. Spending by the government has held close to $98 billion over the last 4 yr. And despite the fact that the coming election may see a change in political leadership, it is generally felt that only a major downswing in the economy would result in a drastic hike in government spending, such as, a broad public-works program.

What is expected is a gradual rise in the level of defense spending to meet the heightening tension of the cold war. This increase in government expenditures, closely appraised, holds one interesting sidelight for coal. An increasing slice of military funds, roughly half of all government spending, is going into electronic equipment, such as, analog computers, control systems for missile ground support and X-ray machines for special-metal inspections. Though not something you can sit down and measure from day to day, the rapidly expanding electronics industry is helping to increase electric requirements, with corresponding benefits for coal, which is used to produce over 55% of the electricity in the United States.

**Private Investment**—This component of GNP goes into capital equipment and inventories of raw materials and finished goods when business looks healthy. At the start of the year most business men were boldly optimistic, spurred on by tales of "The Soaring Sixties." Inventories were built up and McGraw-Hill's survey of capital spending indicated that businessmen throughout industry were planning steep rises in spending on plant and equipment.

In fact, reported McGraw-Hill's economic department at the end of June, the latest figures on new plant and equipment indicated that the big increase in capital spending for 1960 actually took place in the first half. From here on out, the report continued, a modest increase could be expected.

Doing well, but not as well as the most optimistic predictions, businessmen have become cautious, and some even pessimistic. The latter include the machine-tool makers, who are wondering where the expected orders have flown to. Oil-pipe makers are experiencing one of their worst years with oil companies, facing slack demand, cutting down on drilling activities. And appliance makers have had to put into effect hefty cutbacks in their production schedules. Though interest rates have been easing recently no renewed surge of confidence has led businessmen to increase borrowing for new investment.

Inventory control has been the password throughout the country. With this increased control, production so far this year makes the poorest showing just where you might expect: in the volume of raw materials, coal included. Reflecting mainly the drop in steel to below 60% of capacity, output of raw materials has run only a bit higher than 1957 and a little below last year's rates.

There's evidence that the decline in consumption, slight as it appears to have been, has been making inventory-cutting last longer than steel mills had expected.

Steel warehouses, for instance, had geared their metal buying to an expectation that their first-half sales would rise 10% over the 1959 period. Instead, says the Steel Service Center Institute, a warehouse trade association, sales went down 10% so that warehouses wound up the first half with 300,000 more tons of steel than they had figured on having. As a result, the warehouses, which had expected to keep inventories steady from April 1, cut stockpiles into the summer. Despite the cutting, a recent tabulation found warehouse inventories of steel at a record 3.8 million tons—100,000 tons higher even than the stockpile which bulged their shelves at the start of last year's 116-day steel strike. Some steel men blame in part a 4-mo spree of foreign steel importing at the beginning of the year.

**The Upturn**—Optimistic, but no longer with the same glint in their eyes, steel men are betting this month's upturn will be a good deal less steep than had been expected. Auto companies' stepped-up purchases of steel for 1961 models seem sure to push up the August output rate, but steel men now think this gain will be partly offset through continued inventory cutting by other steel users. A number of top mills, which have begun receiving auto orders, report that there is no noticeable pickup in incoming business from other groups of steel users.

**Autos**—In addition to the many blanks drawn in predicting fall construction, appliance sales and capital goods investment, many businessmen have their doubts about the auto season, worry that it may be a flash in the pan without sustained consumer interests. Others express doubt that car dealers will be able to clean up inventories before 1961 models are ready for market.

And no matter how good an auto year 1961 may be, it's bound to be a smaller market for steel because so much of Detroit's product will be in smaller cars, at least 35%. Steelmen now readily admit that the compact car is doing something no competitive material has been able to do, cutting down the amount of steel per car. Say researchers, it takes three compacts to use up as much steel as two standard cars. On the plus side, aluminum is not expected to make a dent in steel's 1961 car market. But this is a certain headache to be faced perhaps by 1962.

**Ahead**—Looking past August, most steelmen see the industry's operating rate moving above 70% of capacity in September and staying in the 70's the rest of the year, perhaps moving a bit higher in the fourth quarter if a rush develops among steel users to buy metal in advance of a possible December increase in steel prices.

Beyond the fall, few businessmen are willing to make a guess, but most economists look for a gradually rising level of business at least until mid-1961. For coal, granted a healthy economy and reasonable competitive conditions, there is still a pretty healthy looking final quarter, and in 1961, another chance to put the 400-million ton mark well behind.

# ORSANCO Goals in Research

**The Coal Advisory Committee to the Ohio River Valley Water Sanitation Commission (ORSANCO) has announced that, in connection with its basic research policy relative to stream pollution from coal mining and other operations, it will undertake a six-point program to further its aims.**

The committee said it will work to:

1. Sponsor a research program intended to develop information necessary for the control of stream pollution resulting from coal mining and related activities;

2. Encourage research by responsible agencies and assist in the enlistment of new and additional thinking and ideas which are germane to the problems of stream pollution in industrial areas;

3. Cooperate with agencies undertaking or planning to undertake research, and encourage cooperation between those responsible agencies conducting research;

4. Encourage and promote the field testing and realistic application of new and additional knowledge as it is developed to improve stream pollution;

5. Promote coordination among various research programs along with field testing and application to help eliminate duplication of effort;

6. Collect and disseminate the knowledge gained from research so that new information will be readily available for application throughout the coal industry.

## SPECIAL REPORT TO CATERPILLAR OWNERS:

CAT CATERPILLAR

Parts you can trust
... cost less per hour

*announcing...*

# BONDED BUY PARTS ASSEMBLIES

PARTS
BONDED BUY
ASSEMBLY

PARTS ASSEMBLY

*Guarantee Bond*

**Know All Men by these Presents,**

that _____

of _____ (hereinafter called Seller),

is held and firmly bound unto _____

of _____ (hereinafter called Buyer)

in the sum of not exceeding the lesser of FIVE THOUSAND DOLLARS ($5,000.00) or Seller's price, with respect to each parts assembly described below, for the payment of which Seller hereby binds itself, its successors and assigns by these presents.

**The Condition of this Obligation is such that Whereas** Seller has sold to Buyer the below-described parts assembly or assemblies originally manufactured by Caterpillar Tractor Co. and reconditioned in accordance with practices recommended by Caterpillar Tractor Co.:

| DESCRIPTION | PART NUMBER | SERIAL NUMBER | SALE PRICE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**And Whereas** Seller guarantees each said parts assembly against unsatisfactory performance due to defective material or workmanship for _____ days after the date of sale shown below (herein referred to as the guarantee period), the obligation under this guarantee being only to repair or replace, as Seller may elect, any said assembly which proves defective in material or workmanship under conditions of normal use during the guarantee period at Seller's expense (including cost of all necessary materials and labor) up to a maximum of the lesser of Five Thousand Dollars ($5,000.00) or Seller's price, with respect to each said assembly, except that the cost, if any, of transporting each said assembly from and to Seller's place of business shall be paid by the Buyer.

**Now, Therefore,** if Seller, its successors and assigns shall in all respects well and truly perform the obligation under the guarantee recited above, then this obligation shall be void; otherwise to remain in full force and effect.

THE ABOVE GUARANTEE IS VOID, AND SELLER SHALL BE UNDER NO OBLIGATION THEREUNDER, IF CLAIM IS NOT MADE TO THE SELLER WITHIN THREE (3) DAYS AFTER DISCOVERY OF THE DEFECT UPON WHICH THE CLAIM IS BASED.

**You can have complete confidence** in any Parts Assembly Exchange or Rebuilt Unit carrying the dealer's new Bonded Buy label. You'll receive a Guarantee Bond, backed by the Lumbermens Mutual Casualty Company of Chicago, Illinois, giving the guarantee conditions agreed upon at time of sale. This is further evidence that a Caterpillar Parts Exchange or Rebuilt Assembly is in first-class condition—another way of expressing the careful and thorough workmanship that goes into each of these reconditioned assemblies.

**The cost?** It compares favorably with the cost of doing the reconditioning work yourself. Often less . . . because of the availability of special equipment and servicemen's skills in the dealer's shop. Your final net cost is based on parts and labor necessary to put your worn assembly in A-1 condition—same as the exchange unit you receive.

**Here's why Cat Reconditioned Assemblies save you money.** You trade down time for more *go* time. Simply:

1. **Call your Caterpillar Dealer and arrange for the Parts Assembly you need.**
2. **Remove your worn assembly and install the reconditioned unit.**
3. **Put your machine back to work immediately and return the worn unit to your dealer.**

**Any way you look at it, a Bonded Buy Parts Assembly is a good deal.** You get a dependable unit . . . guaranteed in writing. The cost is approximately the same had you done the work yourself. Time saved can be converted to cash because your machine's working and earning. Contact your Caterpillar Dealer today. Find out what assemblies he stocks (new items are being added daily).

**SERVICE TIP:** Never allow your present machine components to become worn to the point where reconditioning is impossible.

**CATERPILLAR**

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

## Stonega Employees Complete 100% Training in Safety

EMPLOYEES of Glenbrook Colliery, Stonega Coke & Coal Co., Big Stone Gap, Va., recently completed 100% training in the U. S. Bureau of Mines' course in accident prevention. Instructor was F. A. Cress, coal-mine inspector, USBM, Norton, Va. T. J. Liddle is director of safety at Stonega. Certificates were awarded the company and the union local in recognition of the achievement. Present at the awards ceremony were (left to right) **J. S. Malesky,** district supervisor and **George Betchy,** inspector USBM, Norton, Va.; **W. C. Schott,** vice president, Stonega Coke & Coal Co.; **James Ridings,** district president, UMWA, Middlesboro, Ky.; **R. L. Cochran,** inspector, USBM, Big Stone Gap; **P. F. Allen,** superintendent, Glenbrook Colliery, Keokee, Va.; **James Westfield,** assistant director, USBM, Washington, D. C.; **Vilder Bush,** vice president, Glenbrook local, UMWA; **Charles Ferguson,** director of safety division, UMWA; **Wilmore Deaton,** president, Glenbrook local; **Albert Pass,** district secretary, UMWA; **F. A. Cress; Ray Hubbard,** pumper, Glenbrook Colliery; **H. W. Meador,** general superintendent, **C. H. Hagy,** general manager, and **T. J. Liddle,** director of safety, Stonega Coke & Coal Co.

## Rental Program

**The Anthracite Information Bureau has launched a program to rent boiler plants to apartment houses, schools and other public and commercial buildings.**

The plan introduces for the first time to this field of building management the kind of rental arrangements which have been responsible for the phenomenal growth in leasing of machinery and other equipment by industry in recent years. The lease program offers a number of business and tax advantages to apartment house owners, and affords school boards an opportunity to stay within restricted budgets.

Since there is a substantial reduction in fuel costs through automatic anthracite equipment, the Information Bureau points out, such savings will, in many cases, pay all or an important part of the monthly rental charges.

Under terms of the lease contracts, no down payment or capital investment is required for the installation of a complete boiler plant in new buildings, or for conversion from gas, oil, or hand-fired coal heating plants to automatic anthracite. Nominal monthly rentals are charged during 3- to 5-yr contracts. At the completion of the contract, or after the first year, the owner may purchase title for a relatively small percentage of the initial cost, or continue to rent for as little as $10 per month in apartment house installations, and $20 per month for school equipment.

The bureau points out that commercial space heating is a bright spot in the anthracite business picture, and that the new leasing plan promises to have far-reaching and salutary effects on this market.

"Sales of automatic anthracite equipment are booming and have steadily risen over the past few years to present high levels," a spokesman for the bureau said. "New water-cooled grates are going into some of the newest and most modern schools and buildings, and there is an increasing demand for replacement of existing equipment in modernization programs. This new automatic equipment is setting new records for operating economy through the use of low-cost barley and other small sizes of anthracite and increased efficiencies.

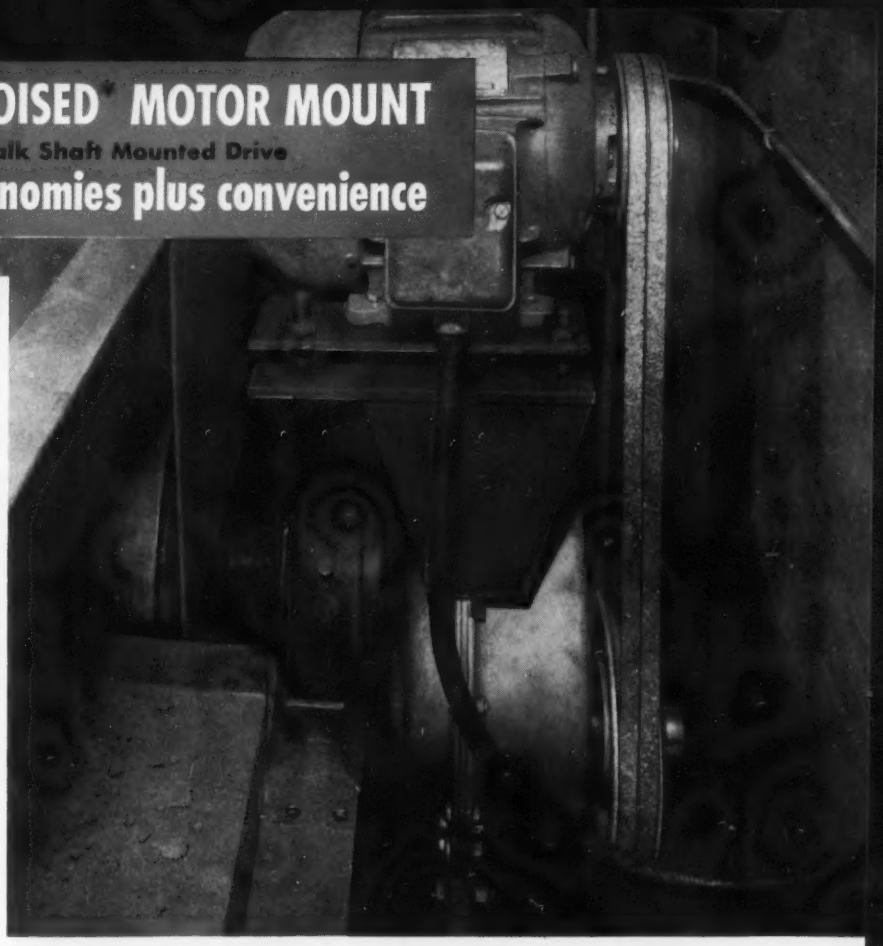
"Completely automatic coal- and ash-handling devices also reduce labor and maintenance cost to a minimum. The popularity of the equipment, combined

(*Continued on p 52*)

# NEW FALK EQUI-POISED* MOTOR MOUNT

for use with the Falk Shaft Mounted Drive

## gives unequaled economies plus convenience



### HOW A FALK EQUI-POISED MOTOR MOUNT REDUCES BEARING LOADS ON A DRIVEN MACHINE

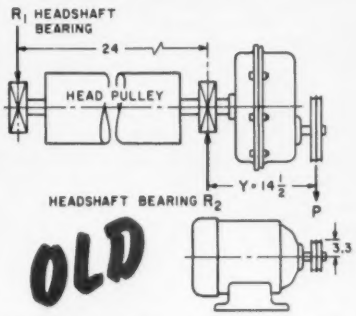
**GIVEN:**

Motor—15 hp, 1750 rpm, Frame 284U, Weight—320 lb.
Sheave diameters—6.6/9.4
Driven machine—belt conveyor with 24" center distance between headshaft bearings.

**NOTE:**

Weights of 307J24 Shaft Mounted Drive, sheaves, and V-belts are eliminated from calculations because they remain constant; do not affect the comparison.

### WITHOUT FALK MOTOR MOUNT




Torque at motor shaft = $\frac{63{,}025 \times 15 \text{ hp}}{1750 \text{ rpm}}$ = 540 lb-in.

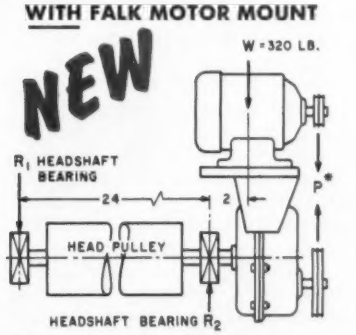
Belt pull (P) = $\frac{540 \text{ lb-in.}}{3.3''}$ x 1.5 Load Connection Factor
= 246 lb

$R_2 = \frac{246 \text{ lb} \times (24'' + 14.5'')}{24''}$ = 395 lb

$R_1 = \frac{246 \text{ lb} \times 14.5''}{24''}$ = 149 lb

(Check: 395 lb—149 lb=246 lb)

### WITH FALK MOTOR MOUNT




*P = ZERO REACTION AT HEADSHAFT BEARINGS

V-belt pull has zero reaction on headshaft bearings. Therefore—

$R_2 = \frac{320 \text{ lb} \times (24'' + 2'')}{24''}$ = 347 lb

$R_1 = \frac{320 \text{ lb} \times 2''}{24''}$ = 27 lb

(Check: 347 lb—27 lb=320 lb)

## Falk's new EQUI-POISED* Motor Mount is a

**rigid, all-steel weldment, pre-drilled for bolting standard NEMA foot-mounted motor (1/2 to 30 hp) directly to the steel frame of Falk Shaft Mounted, Flange Mounted and Screw Conveyor Drives. With it, motor can be mounted in almost any position around perimeter of reducer.**

*(* Balancing of forces.)*

### Substantial Savings for You

It saves engineering time required to design special motor bases and foundations...saves cost of labor and materials required to build special motor foundations...and saves on equipment costs by using a quality stock component. Further, its quick installation and easy maintenance mean added cost savings. The Motor Mount is a space saver, too. Where restricted space is a factor, ability to mount motor in any of several positions is an important convenience...For information on range of sizes, dimensions, etc., contact your Falk Representative or Distributor—or write direct for Bulletin 7100.

**THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN**

*MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS*

**FALK**

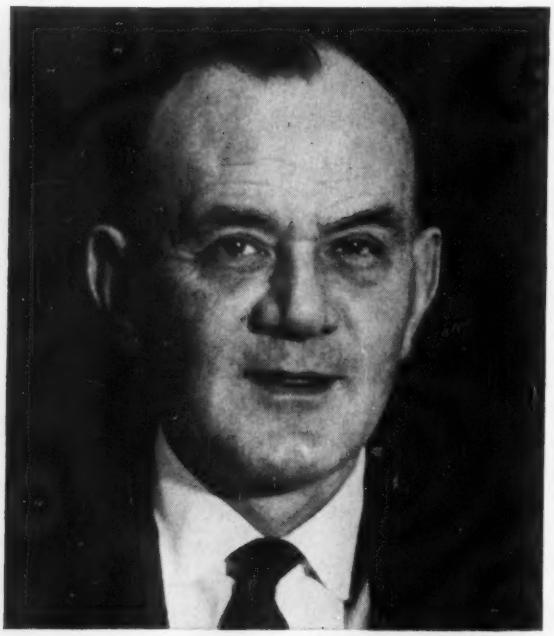
a good name in industry

**Representatives and Distributors in most principal cities**

FALK is a registered trademark

# People in Coal

## McGraw-Hill Encyclopedia Author



DENNIS L. McELROY, executive vice president of Consolidation Coal Co., Pittsburgh, has prepared a 2,000 word article on coal mining for the forthcoming McGraw-Hill *Encyclopedia of Science and Technology*. His contribution includes four illustrations explaining the various mining systems employed in coal extraction.

In making his contribution, Mr. McElroy joins a team of over 2,000 specialist engineers and scientists who, in the past 2 yr, have prepared 7,200 separate articles covering the entire field of science and technology.

The article on coal mining is based largely on the experience Mr. McElroy gained in 33 yr of work in the mining industry. It emphasizes those things peculiar to coal mining from a technical standpoint. It discusses types of seam conditions, methods and machinery, problems such as methane liberation and roof falls and offers a view of the near future in mining techniques.

Mr. McElroy was born Oct. 19, 1904, in Moundsville, W. Va., and was graduated from West Virginia University where he later became Professor of Mining Engineering and Director of the School of Mines.

Elected vice president of Pittsburgh Consolidation Coal Co. in charge of engineering, Feb. 17, 1947, he directed a concentrated program of modernizing operations at 40 of the firm's mines in Pennsylvania, Ohio, West Virginia and Kentucky. More recently, he has been vice president in charge of operations for the company.

**William A. Barringer** has been elected president of the Carbon Fuel Sales Co., Charleston, W. Va., and **L. Newton Thomas** was elevated to board chairman. Mr. Barringer joins the Carbon organization after serving over 2 yr as vice president of sales for The North American Coal Corp., Cleveland, Ohio. Previously, he was general sales manager for the Island Creek Coal Sales Co. He held several positions with Island Creek over a 16-yr period. A native of Charleston, Mr. Barringer is a graduate of Marshall College, where he was president of the senior class in 1936. His education was supplemented at the Harvard University Graduate School of Business Administration and the American Management Association.

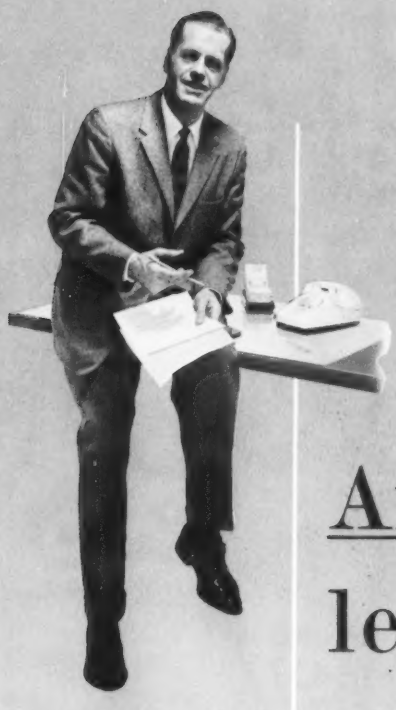
**Julian E. Tobey,** Cincinnati, a consultant, has been named chairman of the joint solid fuels conference planning committee for the 1960 ASME-AIME Joint Solid Fuels Conference to be held Oct. 24 and 25, at the Daniel Boone Hotel, Charleston, W. Va. The event is sponsored by the Fuels Div. of the Society of Mechanical Engineers and the Coal Div. of the Society of Mining Engineers of AIME. Other AIME members of the planning committee are Ernst P. Hall, research consultant, Consolidation Coal Co., and Fred R. Toothman, administrative assistant, engineering, Chesapeake & Ohio Ry. Co. The theme of the conference will be "Economics in the Production and Utilization of Coal."

**Raymond E. Salvati,** president of Island Creek Coal Co., was awarded an honorary Doctor of Laws degree from Wheeling College, Wheeling, W. Va., for his "distinguished career" and to "hold up before the graduates the example of a man who they may strive to emulate." Mr. Salvati worked his way through high school and West Virginia University. His entire post-college career has been in the service of Island Creek, starting as a laborer at $100 a month in 1922. Within a year, he was an assistant mine boss. At 25, he was promoted to superintendent of five mines and at 33 became a vice president and director of the affiliated Pond Creek Pocahontas Co. In 1936, Mr. Salvati was made manager of all Island Creek mines and 4 yr later was named vice president. He was elected president in 1949.

**Herbert E. Jones** has been elected chairman of the board of directors of NCA. He is also chairman of the board of Amherst Coal Co., Charleston, W. Va. Other new NCA officers elected recently are: vice chairman—George E. Enos, president, The Enos Coal Mining Co., Cleveland; and treasurer—David L. Francis, president, Princess Coals, Inc., Huntington, W. Va.

**Lewis E. Evans,** Ebensburg, Pa., is the new secretary of mines and mineral industries, for Pennsylvania. He had been acting secretary since Joseph T. Kennedy's resignation in April.

**A. H. Truax,** director of Truax-Traer Coal Co., has resigned as president of the Illinois Coal Operators Association because of retirement. **Ted L. Kelce,** executive vice president, Peabody Coal Co., has been elected to succeed Mr. Truax. **H. C. Livingston,** president, Truax-Traer, was elected to succeed Mr. Truax as director, representing his company. **F. F. Kolbe,** chairman of the board, The United Electric Coal Cos., resigned as a director and **John M. Morris,** president, United Electric, succeeded Mr. Kolbe, representing the company. The official roster for the association is now as follows: executive board: **Stuart Colnon, Norman E. Kelb, Ted L. Kelce, John M. Morris, Thomas C. Mullins Jr., Frank Nugent, Sam F. Sherwood and H. C. Livingston.** Officers are: **Ted L. Kelce,** president; **C. W. Peterson,** treasurer; **Fred S. Wilkey,** secretary; and **H. K. Beebe,** counsel.

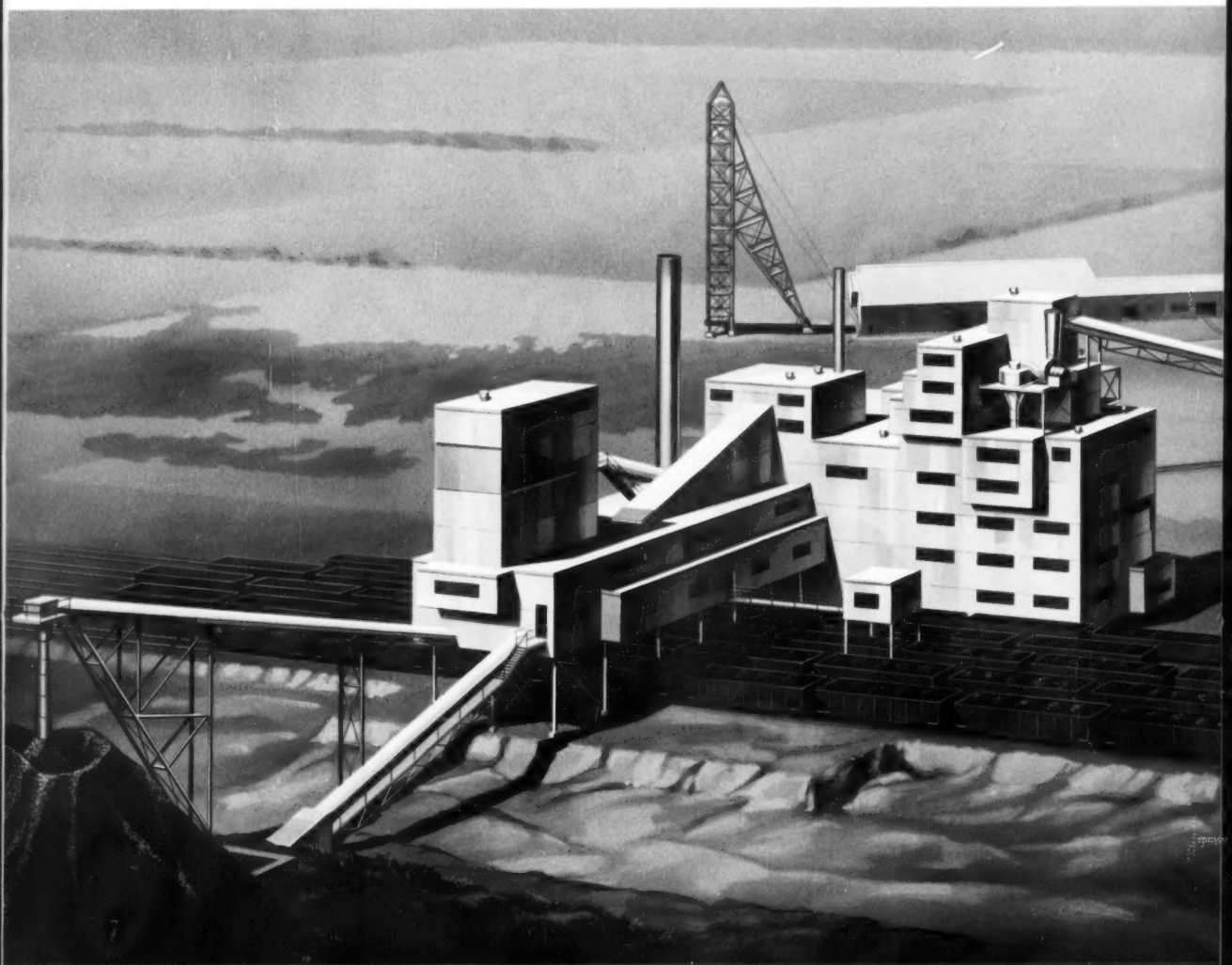


This month's "Man from McNally" report tells about the latest company to plan for tomorrow with a "years ahead" McNally preparation plant.

# Another leading company prepares for future markets with a *McNally High Efficiency Plant*

# Freeman Coal looks forward to years of efficient, low cost coal preparation!

Freeman Coal Mining Corporation
Subsidiary of Material Service Division—General Dynamics Corporation



*ASK THE MEN WHO KNOW COAL FROM THE GROUND UP*

**McNALLY PITTSBURG**

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

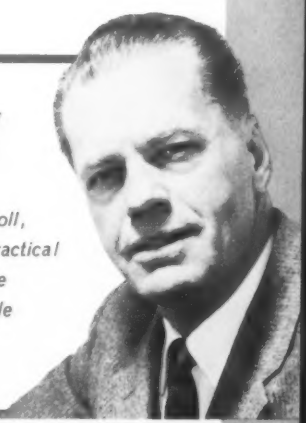
Keeping ahead of competition now and in the years ahead was of utmost importance to the management of the Freeman Coal Mining Corporation when they commissioned McNally Pittsburg to design and build their new preparation plant.

Freeman Coal Mining Corporation's
Orient Mine No. 5 near West Frankfort, Illinois

This new plant receives run-of-mine bituminous coal at 750 tph, which goes to a rotary breaker for sizing to 3½" x 0, thence to a storage bin —and then at 700 tph goes to the plant for sizing and cleaning.

The dense media baths then handle the 3½" x 1" and 1" x ¼" sizes—with the ¼" x 0 delivered to fine coal cleaning tables. The washed ¼" x 0 is dewatered on vibrating screens and goes to the centrifugal dryers.

Thermal dryers then remove excess moisture from two sizes—¼" x 10 mesh and 10 mesh x 0. The 2" x ½", 1½" x 1", 1" x ¼", ¼" x 10 M, 10 M x 48 M, and 48 M x 0 are delivered to tracks for loading out.



## The "Man from McNally" really works for you...

*...for although he is not on your payroll, his experience with the latest, most practical coal preparation equipment is available to make your operation more profitable in every way. Contact him today!*

## *MAIL THE POSTCARD TODAY*

for all the facts about McNally Pittsburg equipment. This handy card needs no postage—just fill it out now—and drop it in the mail.

Gentlemen:

Please send me information about the following equipment:

- ☐ Complete Coal Preparation Plants
- ☐ Norton Washer ☐ Coal Cleaning
- ☐ Heavy-duty Equipment ☐ Conveyors
- ☐ Thermal Dryers ☐ Centrifugal Dryers
- ☐ Crushers ☐ Two-Stage Crushers

NAME_____ TITLE_____

COMPANY_____

CITY_____ STATE_____

C

McNally Pittsburg Manufacturing Corporation

*Manufacturing Plants:*

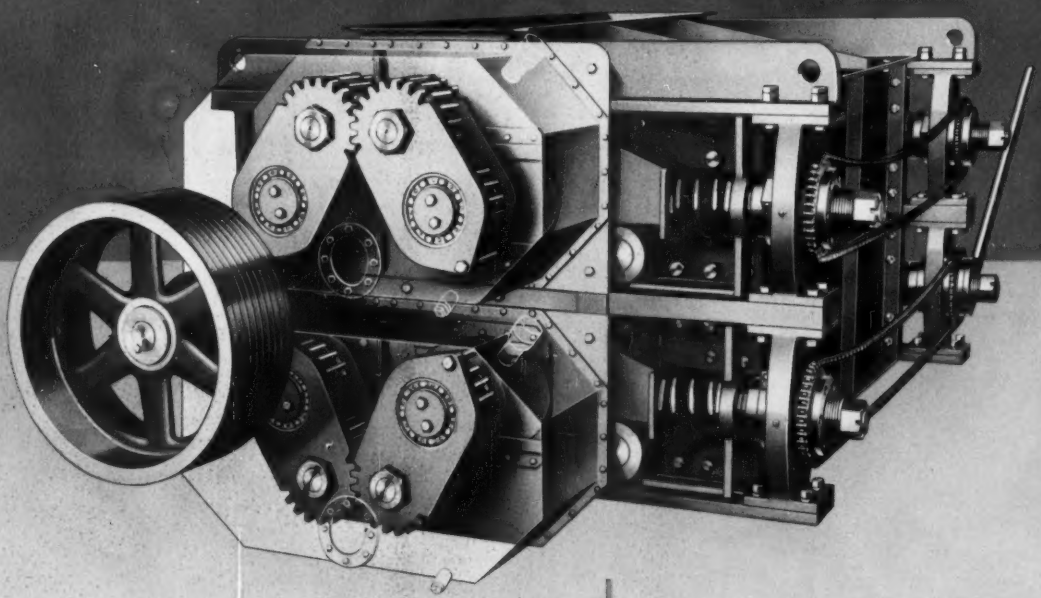
Pittsburg, Kansas • Wellston, Ohio

*Engineering and Sales Offices:*

Chicago • Rio de Janeiro

Pittsburg, Kansas • Wellston, Ohio

# Major mines get practically no oversize with this crusher



This new, two-stage, four-roll Gearmatic Crusher takes coal up to 8" in size and reduces it to a minimum 1" x 0 product. And it has been doing it in major mines across the country with practically no oversize and a minimum of ¼" minus in the crushed product. Available in 36", 48", or 60" widths with capacities from 150 tons to 350 tons per hour. Write today for full details.

## NEW McNALLY TWO-STAGE GEARMATIC CRUSHER

FIRST CLASS
PERMIT No. 93
(Sec. 34.9, P.L.&R.)
PITTSBURG, KANS.

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

5¢ POSTAGE WILL BE PAID BY—

McNally Pittsburg Mfg. Corp.
PITTSBURG, KANSAS

*Write* for full details on this or any other McNally Pittsburg coal preparation equipment

**McNALLY PITTSBURG**
MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNally Pittsburg Manufacturing Corporation
Manufacturing Plants: Pittsburg, Kansas • Weliston, Ohio
Engineering and Sales Offices: Chicago • Rio de Janeiro
Pittsburg, Kansas • Weliston, Ohio

Printed in U. S. A.

## People in Coal (*Continued*)

**M. M. Fitzwater** has been named superintendent at Dehue mine, Buckeye Coal Co., Dehue, W. Va., succeeding Virgil Curry, who was recently promoted to manager of mines for Buckeye Coal (*Coal Age*, June, 1960, p 38). For the past year Mr. Fitzwater was production foreman at Olga Coal Co., Coalwood, W. Va. He is a native of West Virginia and a graduate of West Virginia University in mining engineering. Mr. Fitzwater joined the Buckeye organization at Nemacolin, Pa., in 1950. Prior employment was with Eastern Gas & Fuel Associates and Warner Collieries. He is a World War II veteran of the U. S. Air Force.

**Harold B. Wickey,** vice president in charge of anthracite operations, Glen Alden Corp., Wilkes-Barre, Pa., last month announced his resignation from that position. A mining engineering graduate of Penn State University, Mr. Wickey was vice president of operations at the coal properties of Penn-Texas Corp., Ehrenfeld, Pa. He later joined Lehigh Valley Coal Co., Wilkes-Barre, as executive vice president, and moved from there to the vice presidency of Glen Alden in 1958.

**W. J. Rude** has been named assistant to the president at Glen Alden's anthracite operations, according to an announcement by Harry W. Bradbury, president of Glen Alden's coal subsidiaries. Prior to spending the last 1½ yr in the Philippines, Mr. Rude was vice president in charge of coal operations of American Electric Power System. He has served in management positions with Pittsburgh Coal Co. and Phosphate Mining Co. in Florida. Mr. Rude's appointment at Glen Alden became effective July 1.

The Big Sandy-Elkhorn Coal Operators Association, meeting recently in Lexington, Ky., re-elected **William Crawford** as president. Mr. Crawford is vice president of Princess Coals, Inc., at Mallory, W. Va. Other officers, all re-elected are: first vice president, **B. F. Reed,** treasurer of Turner Elkhorn Mining Co., Drift, Ky.; second vice president, **George E. Evans, Jr.,** president of Evans Elkhorn Coal Co., Wayland, Ky.; treasurer, **L. B. Brashear,** president of Stephens Elkhorn Fuel Corp., Manton, Ky., and administrative secretary, **Joseph H. Lyons,** Pikeville, Ky.

## Coming in September

Third in the series of *Coal Age* Operating Guides, a 16-p special report on Cutter and Drill Bits, will be bound into next month's issue. Included in the report is a complete roundup of all types and maintenance instructions.

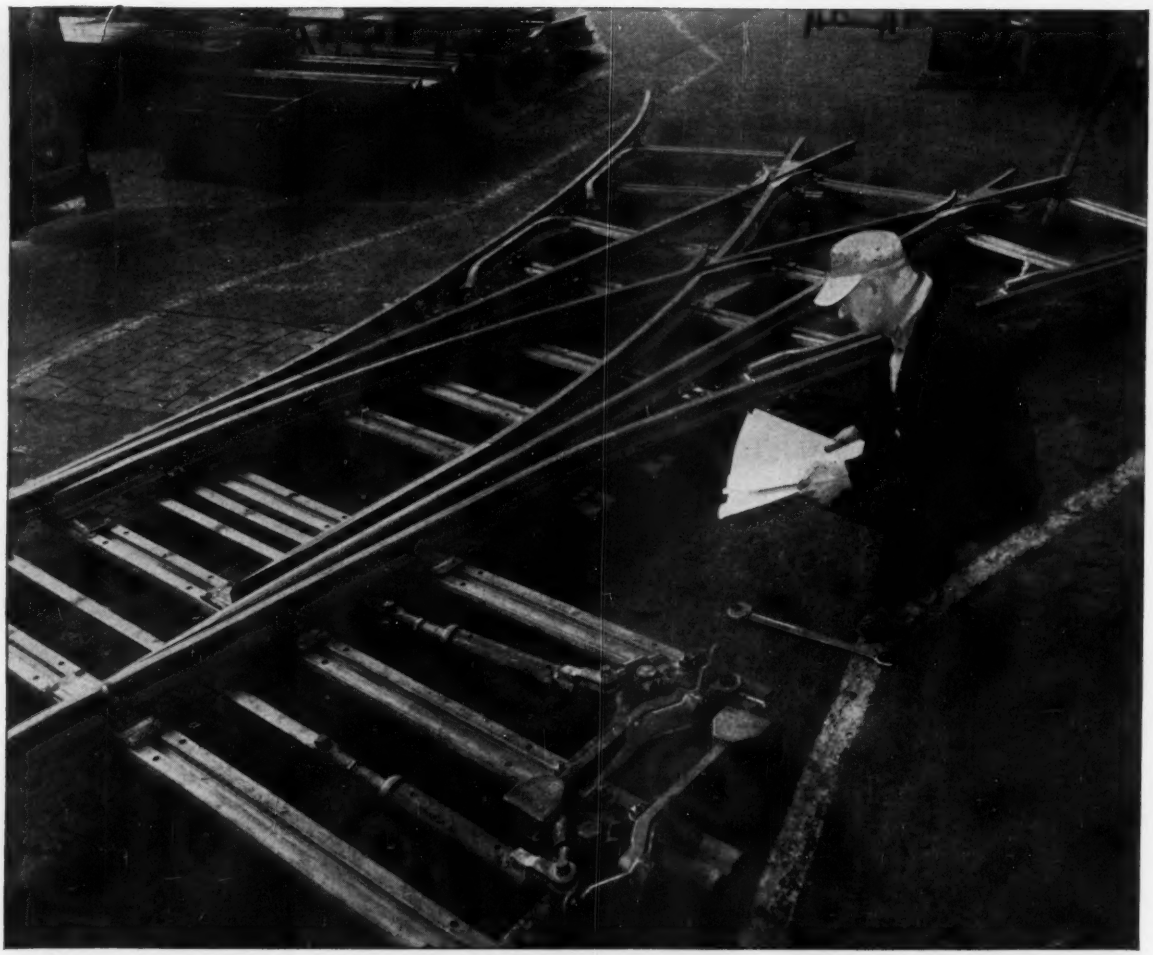

Basic tools of underground mining

A-2755A

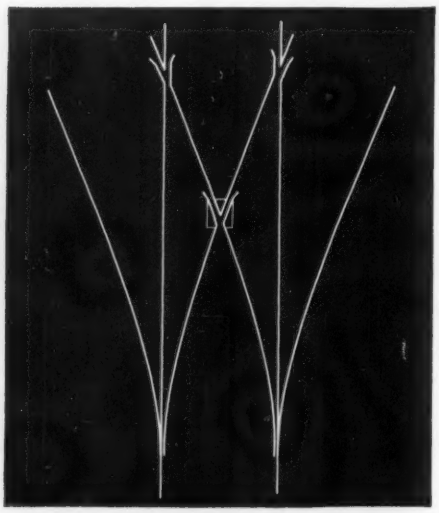
USED IN 1833 AUSTIN & EVER SINCE

AUSTIN
POWDER COMPANY
CLEVELAND 13, OHIO

explosives • ammonium nitrates • primers • detonating fuse
permissibles • blasting supplies • AP drill heads and bits • mine tools



# One 3-way turnout coming up!



This tricky turnout—just part of a complete prefabricated track layout—was expertly built up from 30-lb AS rail to 42-in. track gage. Crotch frog is of riveted-plate construction, while the end frogs are cast manganese steel. Every piece was meticulously checked in position at our Johnstown, Pa., plant to assure perfect fitting at the job-site.

And so with all Bethlehem special trackwork projects. Thorough study of the customer's needs, skillful fabrication of the various parts, and careful check on every detail inevitably result in efficient track that soon pays for itself. A Bethlehem engineer would like to discuss this Bethlehem service with you, at your convenience.

BETHLEHEM STEEL COMPANY

Bethlehem, Pa.

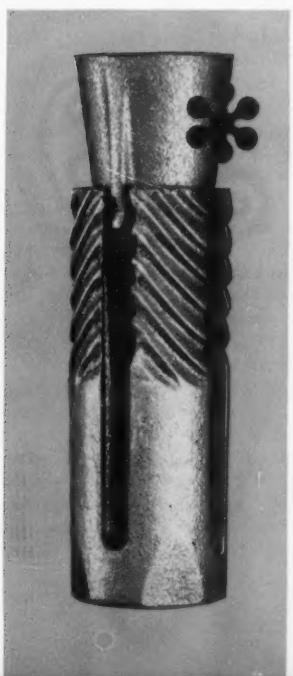
EXPORT DISTRIBUTOR: Bethlehem Steel Export Corporation

**BETHLEHEM STEEL**

BETHLEHEM STEEL

O-B Designs For Mining Men

# A 4-way expansion unit that holds in soft shale or hard rock



**4-WAY EXPANSION UNIT BUILDS HOLDING POWER FAST** . . . because the flexible fingers of the shell are slightly pre-expanded to grip the wall even before wrenching begins.

**GOES UP FAST AND STAYS PUT.** When the bolt is shoved up the hole, the expansion unit holds the bolt in place until it's tightened . . . no need to have hands exposed to injury during wrenching.

**GREATER STRENGTH IN HARD TOP . . . BETTER "PURCHASE" IN YIELDING TOP** . . . because the expansion pressures are spread evenly over the four shell fingers to make the best use of the entire unit's strength. These are the reasons for the O-B Expansion Unit's popularity with mining men. It is easy to understand why more mine roof is supported with O-B Shells and Plugs than with any other kind.

For further information and prices, see your local O-B sales-engineer or write us now. OHIO BRASS COMPANY, MANSFIELD, OHIO. Canadian Ohio Brass Company, Ltd., Niagara Falls, Ontario.

Ohio Brass

HOLAN

EXPANSION SHELLS AND PLUGS • LINE MATERIALS • SAFETY AND CONTROL EQUIPMENT • ELECTRIC HAULAGE MATERIALS

T0048-M

# Current Coal Patents

By **Oliver S. North**

**Multiple head coal mining auger, G. L. Adams (assigned to The Salem Tool Co., Salem, O.), June 14, 1960.** In an improved coal augering machine, two spaced apart auger strings are connected to drive three or four cutting heads. The two auger strings are preferably of opposite hand, and have fixed sections extending rearwardly from each cutting head to convey the cuttings laterally. Two auger strings are adequate for three or four heads, but five heads necessitate use of three auger strings. This arrangement avoids overloading of the conveyor strings. No. 2,940,740.

**Traveling conveyor device, particularly for underground mining, W. Heidemann, June 21, 1960.** Design for a mine conveyor having at its loading end section a stuffing or tamping device which compacts the coal as it is loaded, thereby preventing the pieces of coal from rolling around on the conveyor during movement thereof. No. 2,941,680.

**Pick boxes for cutter chains of mining machines, G. Jerrit (assigned to Mavor & Coulson Ltd., Glasgow, Scotland), June 21, 1960.** Design for a cutting chain pick box comprising a link component adapted to be connected with adjacent pick boxes and a complementary separately made holder component which is rigidly secured to the link component and which has a recess to serve as a socket for the pick. The number of prototypes required is reduced to two, compared with the usual ten or twelve. No. 2,941,789.

**Tunnel boring machine having flexible belt shaker conveyor, J. F. Joy (assigned to Joy Mfg. Co., Pittsburgh, Pa.), June 28, 1960.** Design for an improved carriage or launching device for a boring type mining machine, whereby the machine may be quickly moved, is adequately supported during the initial face penetration operation, and will rapidly excavate coal and move it away from the face. No. 2,942,863.

**Mine roof stress indicating bolt, V. A. Curry, July 5, 1960.** Design for a stress indicating bolt for a mine roof plate. The bolt head has an integral flange of predetermined fixed characteristics which indicates by its deformation during setting up of the bolt when the proper tension on the latter has been attained. No. 2,943,528.

**Mining conveyors, G. Domman (assigned to Gewerkschaft Eisenhutte Westfalia, Wethmar, nr. Lunen, Germany), July 5, 1960.** Design for an improved trough section for a double-chain mining conveyor, wherewith worn sections of the side walls are readily replaceable. No. 2,943,728.

**Feed apparatus with lock chambers for hydraulic conveying, O. Hrabovszky and L. Pányi (assigned to Licencia Találmányokat Erté-kesito Vállalat, Budapest, Hungary), July 5, 1960.** In an installation for lifting coal in mine shafts by hydraulic means, a feed apparatus with lock chamber is provided for drawing coal by suction from the regulating hopper into the piston cylinder; the cylinder takes an equal quantity of water from the pure water pipe. Introduction of material into the conveying pipe does not cause a pressure differential. No. 2,943,890.


# How to keep customers happy— all winter long

**Treat all shipments with Sterling Rock Salt,** and your customers will be able to unload coal *fast* even in freezing weather. They won't have to thaw your cars or loosen coal by hand. Customers will gladly pay the small premium for coal that is treated so it won't freeze up! You can apply Sterling Rock Salt quickly, too. Just three or four bags of this effective anti-freeze agent will keep an entire carload of coal from freezing! (It takes only 5 lbs. of Sterling Rock Salt to protect one ton of bituminous; 5-8 lbs. for anthracite.)

You can also use Sterling Rock Salt to prevent frozen scales and switches . . . to keep roads and yards clear throughout the winter. It removes snow and ice *fast*. Comes in bulk carloads or packed in 100-lb. bags.

Free folder gives further information on Sterling Rock Salt for mines, collieries. Ask your Sterling representative or write to INTERNATIONAL SALT COMPANY, DEPARTMENT CA-8, CLARKS SUMMIT, PA.

SALES OFFICES:

| | | | |
|---|---|---|---|
| Boston, Mass. | Chicago, Ill. | Newark, N. J. | Philadelphia, Pa. |
| Buffalo, N. Y. | Cincinnati, Ohio | New Orleans, La. | Pittsburgh, Pa. |
| Charlotte, N. C. | Detroit, Mich. | New York, N. Y. | St. Louis, Mo. |

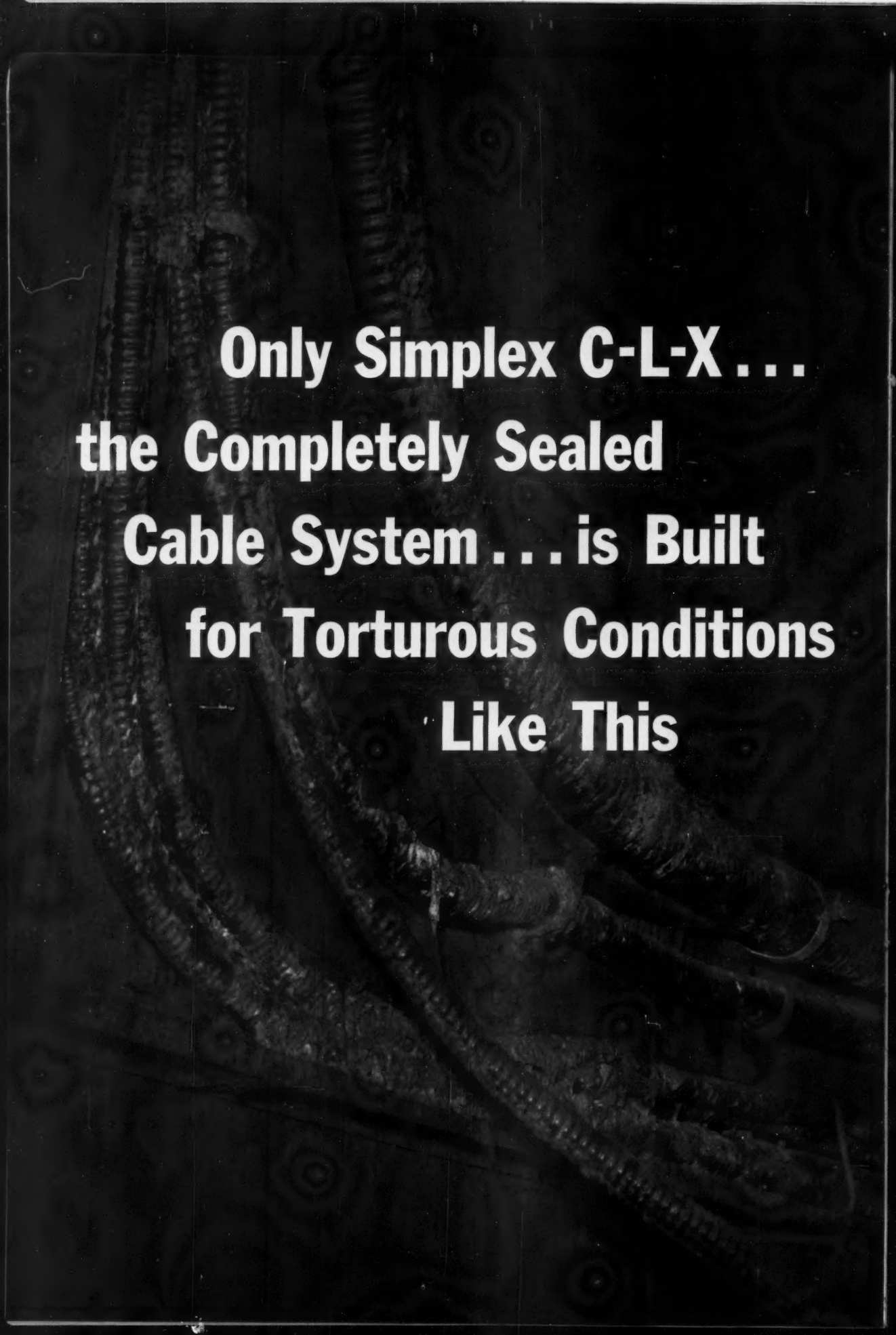
STERLING ROCK SALT
INTERNATIONAL SALT COMPANY, INC.

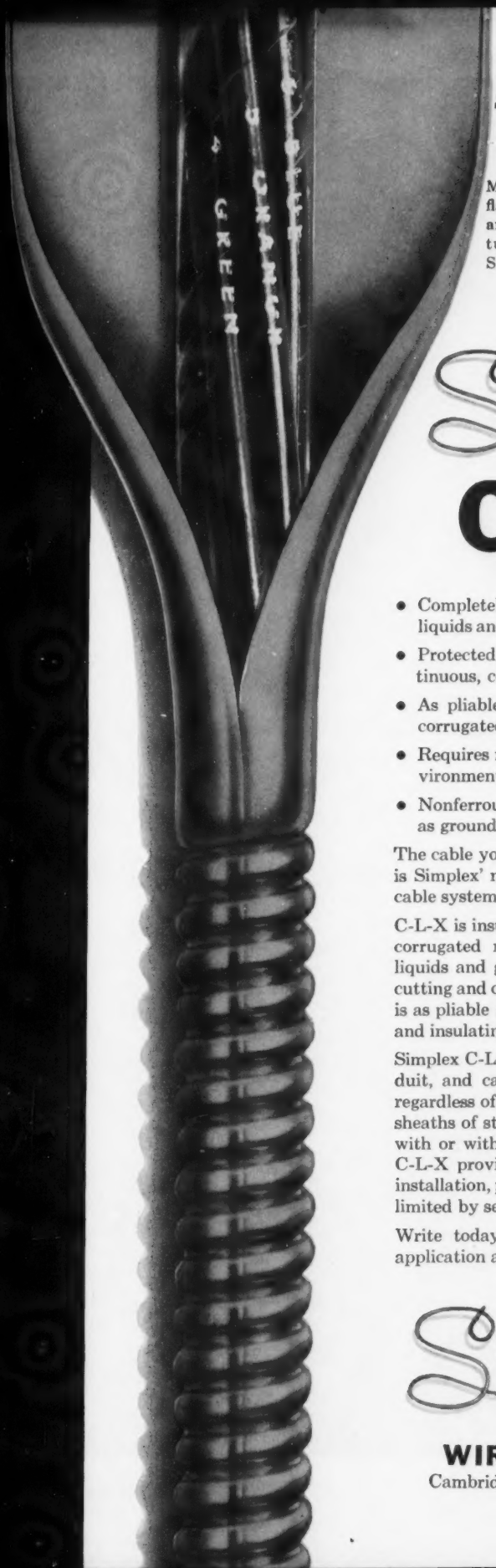
**THIS IS MSA: Fire Fighting Equipment** • Rock Dusting and Dust Collecting • Illumination • Electronic Communication and Control Respiratory Protection • Artificial Respiration Equipment • Personal Protective Wear • First Aid Equipment • Permanent and Portable Instruments

**Prevention is the best control for mine fires . . .** but, if a fire starts, immediate use of on-the-spot equipment keeps it under control. Then, major fire fighting equipment can be brought up and completely extinguish the fire. MSA has the products that give you this kind of fire protection.

M-S-A® Dry Chemical is a specially prepared sodium bicarbonate for instant mine fire control. Available in 60-pound bags, it can be stored at vital fire control locations. Should fire occur, Dry Chemical can be spread immediately by M-S-A® Rock Dust Distributors, shovel or, even by hand. It plugs the crucial time gap until large capacity fire trucks arrive. M-S-A® Fire Trucks, available in various sizes, provide the capacity needed to extinguish fires.

Call your MSA representative for additional information. Or write for helpful literature. Mine Safety Appliances Company, 201 North Braddock Avenue, Pittsburgh 8, Pennsylvania. In Canada: Mine Safety Appliances Company of Canada Ltd., 500 MacPherson Avenue, Toronto 4, Ontario.


Only Simplex C-L-X . . .
the Completely Sealed
Cable System . . . is Built
for Torturous Conditions
Like This



*Simplex C-L-X combines cable and duct in one integrated system*

Metal, in the form of a continuous flat strip, is formed into a welded tube around the insulated cable. The metal tube is then corrugated to form Simplex C-L-X.

Simplex

# C-L-X

- Completely sealed to prevent penetration of liquids and gases.
- Protected against mechanical damage by a continuous, corrugated metallic sheath.
- As pliable as unsheathed cable because of its corrugated design.
- Requires no separate duct or conduit in any environment.
- Nonferrous sheaths can be designed to function as grounds or shielding.

The cable you see here is *not* interlocked armor. It is Simplex' new C-L-X . . . the completely sealed cable system.

C-L-X is insulated cable enclosed in a continuous corrugated metallic sheath. It is impervious to liquids and gases, is highly resistant to crushing, cutting and other forms of mechanical damage, and is as pliable as unsheathed cable of the same size and insulating compound.

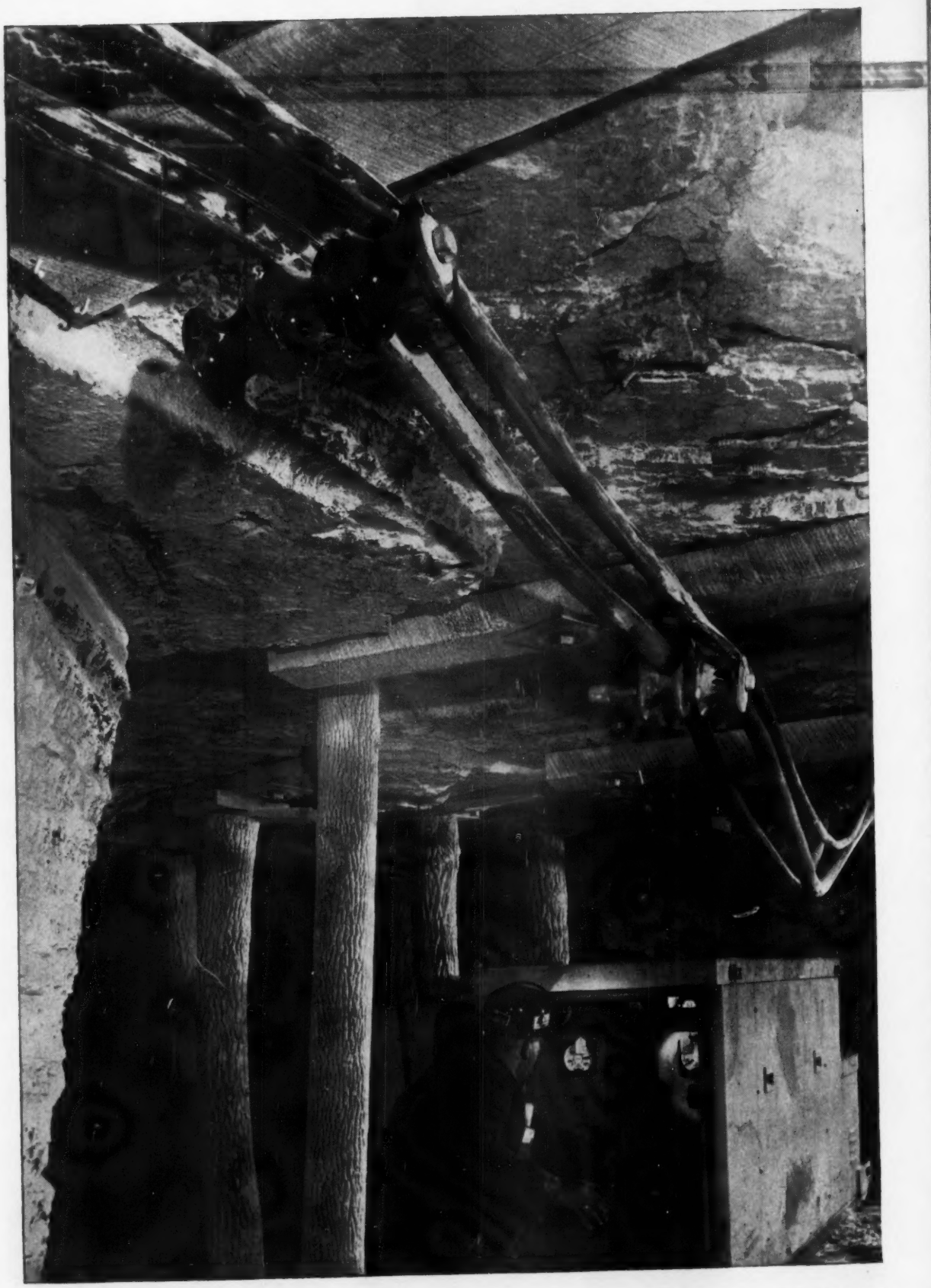
Simplex C-L-X requires no separate duct or conduit, and can be installed in a continuous run regardless of the number of bends. Available with sheaths of steel, aluminum, copper or bronze, and with or without outer plastic jacketing, Simplex C-L-X provides the ideal solution for almost any installation, particularly those in which cable life is limited by severe ambient conditions.

Write today for illustrated brochure containing application and engineering information.

Simplex

**WIRE & CABLE CO.**

Cambridge, Mass. • Newington, N. H.



# WESTINGHOUSE A-C EQUIPMENT HELPS SLASH POWER SYSTEM COSTS BY 30% AT THUNDERBIRD MINES

"Using Westinghouse transformers and switchhouses, we have installed one of the nation's first major a-c deep-mine power transmission systems at the Thunderbird Mines . . . and at 30 to 35% less initial cost than with any comparable system," reports Lester E. Briscoe, Electrical Engineer and Safety Director. Thunderbird Mines, at Farmersburgh, Ind., are operated by Ayrshire Collieries Corporation.

"Three considerations," continues Mr. Briscoe, "influenced our decision to install the a-c power system: safety, initial costs, and maintenance."

SAFETY—"A great benefit of our a-c system," says Mr. Briscoe, "is its inherent safety factor. We do not fear motor flashes which could easily ignite the mine gases with concurrent fire and explosion hazards. Any malfunction of equipment is immediately tripped off the line and subsequently grounded.

INITIAL COSTS—"We do not need the costly rectifiers normal in a d-c power system, and our Westinghouse transformers were about one-fifth the cost of d-c rectifiers. The easy mobility of these units means we could eliminate tracks in the mine. We believe our power cost per ton of coal is considerably less than with a d-c power system because of very high transformer efficiency and because power losses are less."

MAINTENANCE—"We have not had one iota of trouble with our 5-kv a-c power system, and we can readily live up to our contractural obligations to mine more than a million tons of coal a year." A-c power equipment is simpler and has fewer moving parts than complex d-c equipment; hence, maintenance is greatly reduced.

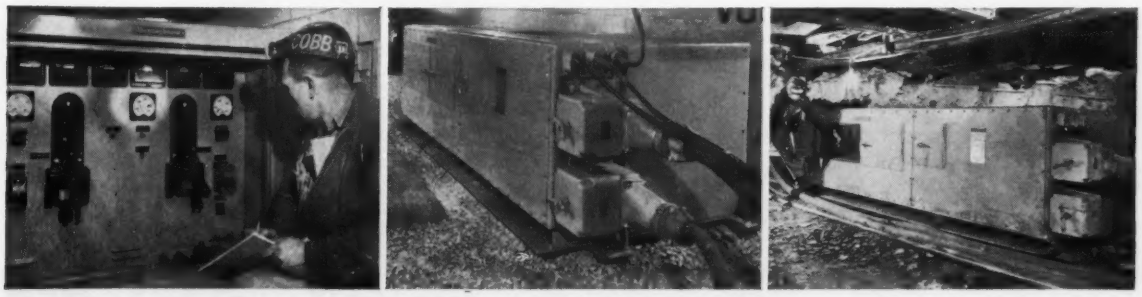
"On top of these advantages, the Westinghouse equipment is 100% more flexible than d-c apparatus. We can work farther and farther away from the voltage source with absolutely no inconvenience, holding to 440-640 volts at the working faces. We will not be forced to reset regulators to raise the voltage until we reach 8000 feet from the bore holes."

Mining operations at Thunderbird are currently 220 feet underground, where Westinghouse equipment is strategically placed. Power is obtained from the local utility at 67,000 volts and stepped down to 4160 volts by transformers in conjunction with voltage regulators which help to hold good voltage underground. Cables running through bore holes deliver 4160-volt power through underground Westinghouse switchhouses to Power Centers which step the voltage down to 480 volts. These transformers are connected to a series of skid-mounted distribution centers which feed power to mining equipment directly at the working face and to the Westinghouse motors driving conveyor belts.

J-96151

The Thunderbird Mine is an outstanding example of a system ideal for continuous conventional operation. Westinghouse has long experience in helping coal producers achieve greater safety and continuity of service through the use of sealed-mine Power Centers. Your nearest Westinghouse representative has full particulars. Contact him, or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa.

Westinghouse



WESTINGHOUSE SWITCHHOUSES in Thunderbird Mines feed 4160-volt power to Power Centers. Each unit contains one or more circuit breakers for maximum protection to men and equipment, to help minimize possibility of flashovers. Switchhouses are easily moved so power is supplied to mining equipment with little voltage loss. At left is a single-breaker switchhouse . . . above is a two-breaker switchhouse.

WESTINGHOUSE SEALED-MINE POWER CENTERS safely and reliably step incoming 4160-volt power to 480 volts. Nitrogen-filled, silicone-insulated centers are completely protected from contaminated mine atmosphere for safe, uninterrupted operation. Above center, a 300-kva Power Center serving a slope belt and auxiliary loads. At right, Chief Electrician Louis Cobb checks a 300-kva Power Center serving face machinery.

Note skid mounting for easy movement of Power Centers when necessary.

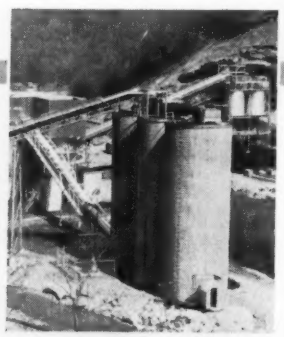
If you store large quantities of bulk materials . . . you can realize important savings in time, space, materials and labor with a custom-designed Marietta Industrial Storage System.

A Marietta System, tailored to your precise requirements, concentrates storage and virtually eliminates the sprawling space requirements and material losses of unprotected ground storage; you get maximum use from every foot of storage area.

Easily integrated into any materials handling system . . . old or new . . . Marietta Industrial Silos speed loading and unloading operations; save time and cut labor costs. And, Marietta Industrial Storage eliminates the need for costly bagging and gives greater protection.

Learn how a Marietta Storage System can cut costs in your operation. Write today for a complete analysis of *your* bulk storage problem . . . and be sure to ask for the Marietta Industrial Storage System Booklet.

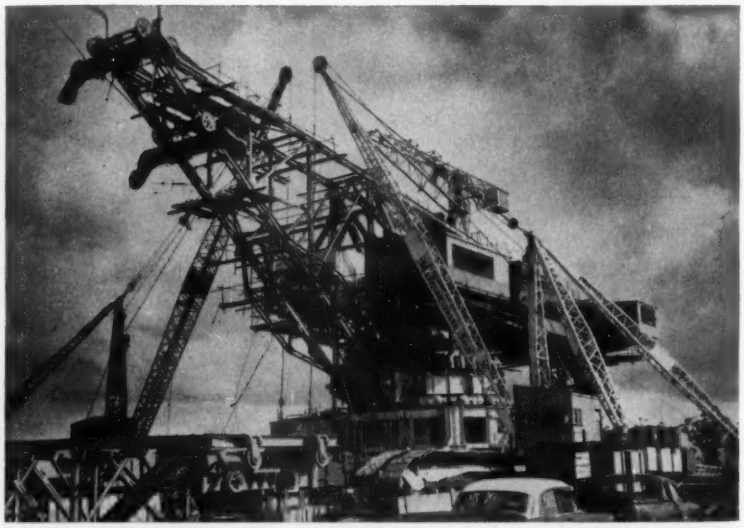
*Only Marietta makes four types of concrete staves to insure the best construction for every installation.*



**MARIETTA**
**engineered**
**INDUSTRIAL STORAGE SYSTEMS**
**cut costs and space requirements**

Marietta
CONCRETE DIVISION
AMERICAN-MARIETTA COMPANY
Marietta, Ohio
Representatives in principal cities

# Coal Abroad



**THIS COAL DREDGER,** a bucket-chain model mounted on crawler tracks and said to be the largest in the world, will enter service later this year in Victoria, Australia. The giant machine was purchased for $2.4 million by the State Electricity Commission of Victoria and is being built at a mammoth open cut at Yallourn. The guaranteed digging rate is 1,750 tph of brown coal and the whole operation requires a crew of only three. The dredger, made by Maschinenfabric Buchau R. Wolf, Germany, can dig down 87 ft below the bench on which it operates or to a height of about 95 ft above it. It has 54 buckets with a digging capacity of about 1 long ton per bucket. Total weight is 2,050 long tons with a height of 90 ft. It is supplied with 6,600 V through a trailing cable and moves on two huge crawler tracks, each 115 ft long and 10 ft wide.

## German Fuel Battle Gets Tougher

Gas use seen on the rise with oil and coal losing ground.

ANY HOPES American coal producers had of getting back quickly a substantial portion of the German fuel market lost when a $4.76 tariff was slapped on imported coal in that nation seem slim.

With the discovery of new natural gas reserves in Weserbergland, West Germany, the country's annual gas production is estimated to rise to 70.6 billion cu ft by 1962 from 13.7 billion in 1959, according to a report of the German Institute for Economic Research.

This development is believed by the Institute to be another indication of far reaching structural changes in the German power and fuel markets during the next few years. The development began with the successive taking over by oil of markets which formerly were reserved to coal, resulting in the recent coal crisis. But now, the Institute claims, oil itself is under pressure of competition from natural gas.

As proof of this, the Institute points to the conversion of the German state-

LESCHEN WIRE PORTER ROPE DIVISION
H. K. PORTER COMPANY, INC.

# 75,000,000

## BUTT-WELDED RAIL BONDS*

# they must be good!

**question:**

What is the best method of attaching a flexible strand to a solid end piece so that the connection will have both the highest electrical conductivity and the greatest mechanical strength?

**possibilities:**

Soldering, drop forging, cold pressing, brazing, flame welding, or butt welding.

**answer:**

Butt Welding! Only with machine butt welding can consistent electrical and mechanical results be obtained with clock-like regularity. Only with butt welding can you be sure that in every case all the wires in the strand are electrically connected permanently to the solid end piece. Only butt welding will consistently develop full strength of the strand on a tensile test to destruction. *The butt weld is stronger than the strand!*

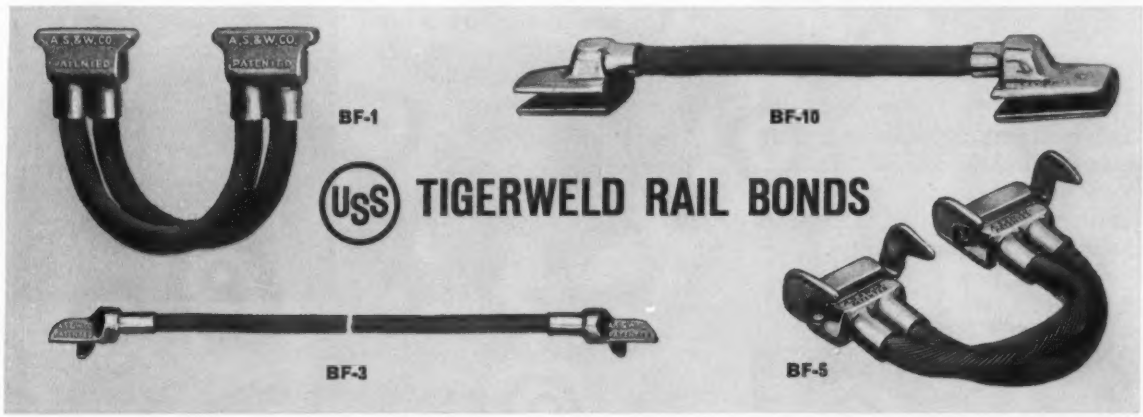
Butt welding has found a wide application in the art of rail bonding, and we are proud to announce that the 75 millionth butt weld bond has been produced by the industry—with more and more following every day!

What greater proof of its reliability can be had?

Specify TIGERWELD Bonds . . . they're *all* butt welded!

For more information, write for our free booklet "Tigerweld Power Bonds." American Steel & Wire, Dept. 0333 Superior Ave., N.W., Cleveland 13, Ohio.

*USS and Tigerweld are registered trademarks*

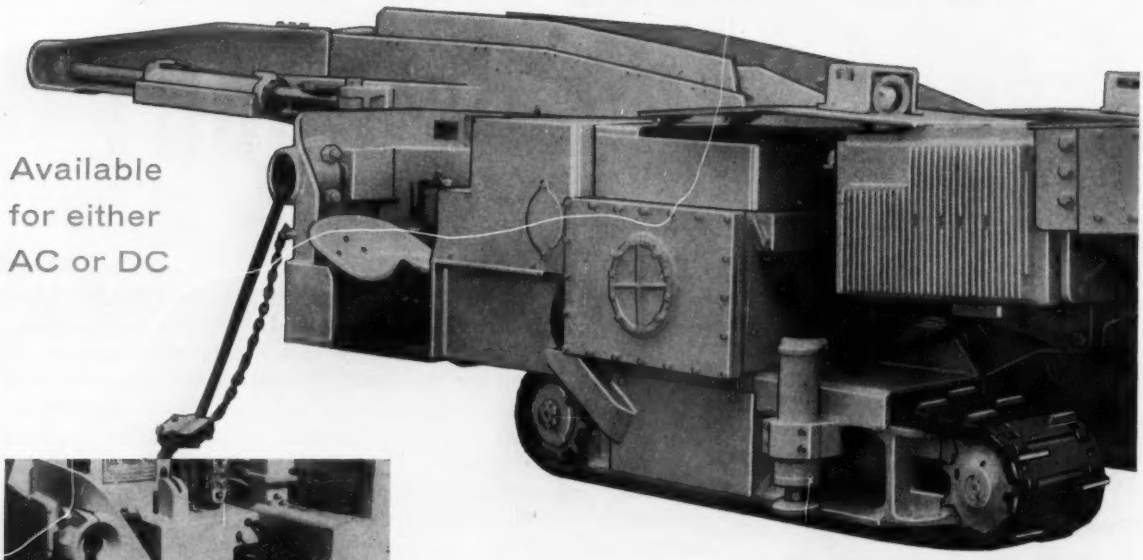



*Covered by Patent Numbers 2,008,786—2,008,787—2,023,317—2,213,990.

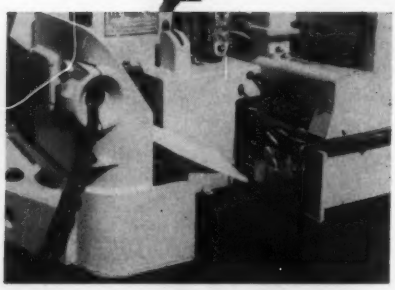
**American Steel & Wire Division of United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, Distributors Abroad

# LIGHTWEIGHT COST *plus* HEAVYWEIGHT *equals* PRODUCTION



Available for either AC or DC



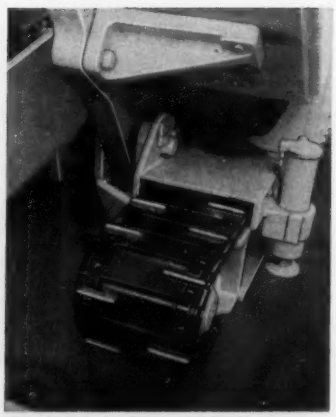
### OPERATOR'S PLATFORM

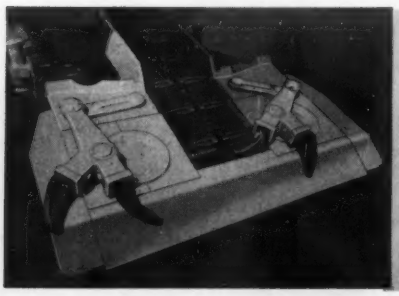
Compact and convenient hydraulic and electrical controls are within easy reach of the operator. Throttle valve precisely controls the speed of all hydraulic operations as well as providing "deadman" control.

### 16″ WIDE CRAWLER

The new crawler with heavy-duty gearing can operate the miner on steep grades and also float on soft bottom.

**Less than 25 P.S.I. ground pressure.**



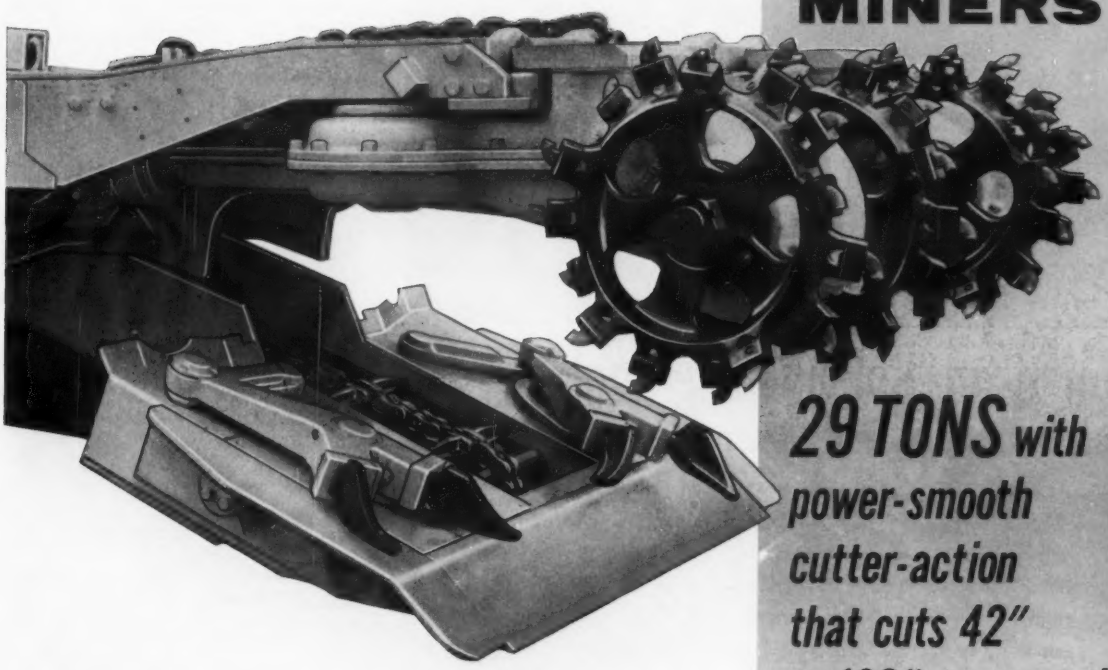


### GATHERING HEAD

The exclusive "dual gathering arms" provide maximum reach and much better flow to the conveyor.

# PERFORMANCE PUNCH

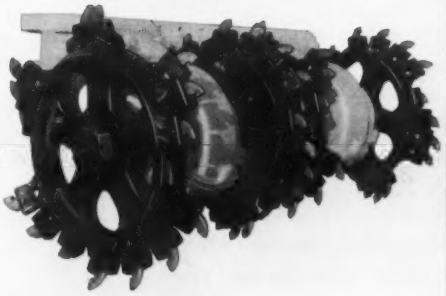
## Lee-Norse CM38 and CM48 MINERS



**29 TONS with power-smooth cutter-action that cuts 42" to 120" seams and gathers loads as fast as they are cut**

### CUTTING HEADS

New "Rap-Lok*" Cutter Bits, spaced evenly around cutter rim, provides smooth, vibrationless performance. Extremely quick "bit change"—no set screws—long bit life.



*Trade Mark of The Cincinnati Mine Machinery Co.

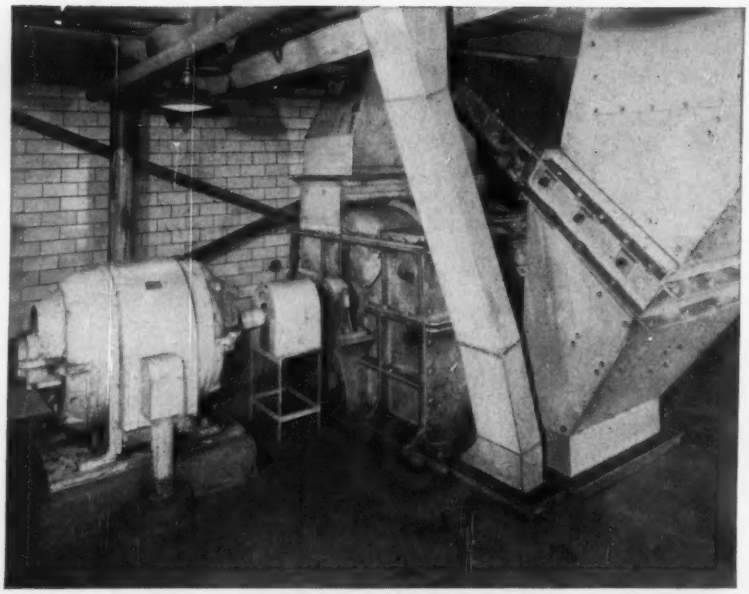
Lee-Norse Company

CHARLEROI, PENNA.

*Specialists in Coal Mining Equipment*

Coal high or low?... Lee-Norse MINERS keep production on the go!

# CRUSHING FACTS



## American "Rolling Ring" Coal Crusher
### *splits coal... smashes maintenance costs!*

In almost five years, the above American Coal Crusher has reduced 1,800,000 tons of 2" x 0" coal to a ¾" x 0" product for a prominent midwestern utility. Since installation, this unit has handled an average annual tonnage of 450,000, with a very low ratio of replacement parts to tonnage. The operating engineer for this utility says, "We have experienced no stoppages . . . crusher operation and maintenance have been very satisfactory."

*"Rolling Ring" design makes the difference.* Specially designed rotor, consisting of four rows of patented shredder rings, each suspended on a single shaft, rotate freely at a relatively *slow speed.* Coal is *split* rather than smashed. This splitting action saves both power and maintenance, gives more uniform sizing, fewer fines. Rings can be reversed to give extended life.

American has manufactured reduction equipment since 1908 and you can be sure that "When you figure costs, the best results come from American *Rolling Ring* Crushers." If you have a coal preparation problem, why not write today for recommendations and literature. Our highly-trained engineering staff will give you prompt assistance.

American PULVERIZER COMPANY
ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS
1119 MACKLIND AVE. ST. LOUIS 10, MO.


directed power company, Preussische Elektrizitats AG, Hannover, which in the future, will use gas as fuel instead of oil. The Hoesche-AG, Dusseldorf, is also reported to be considering future use of natural gas as its energy basis instead of coal.

Also, in other fields, gas is beginning to compete with oil. It is increasingly gaining as basic material for German petro-chemical industries, exerting pressure on oil prices. And new regulations, under consideration by the Bonn government, for de-contamination of air and waters near industrial centers and big cities, may put further pressure on both oil and coal.

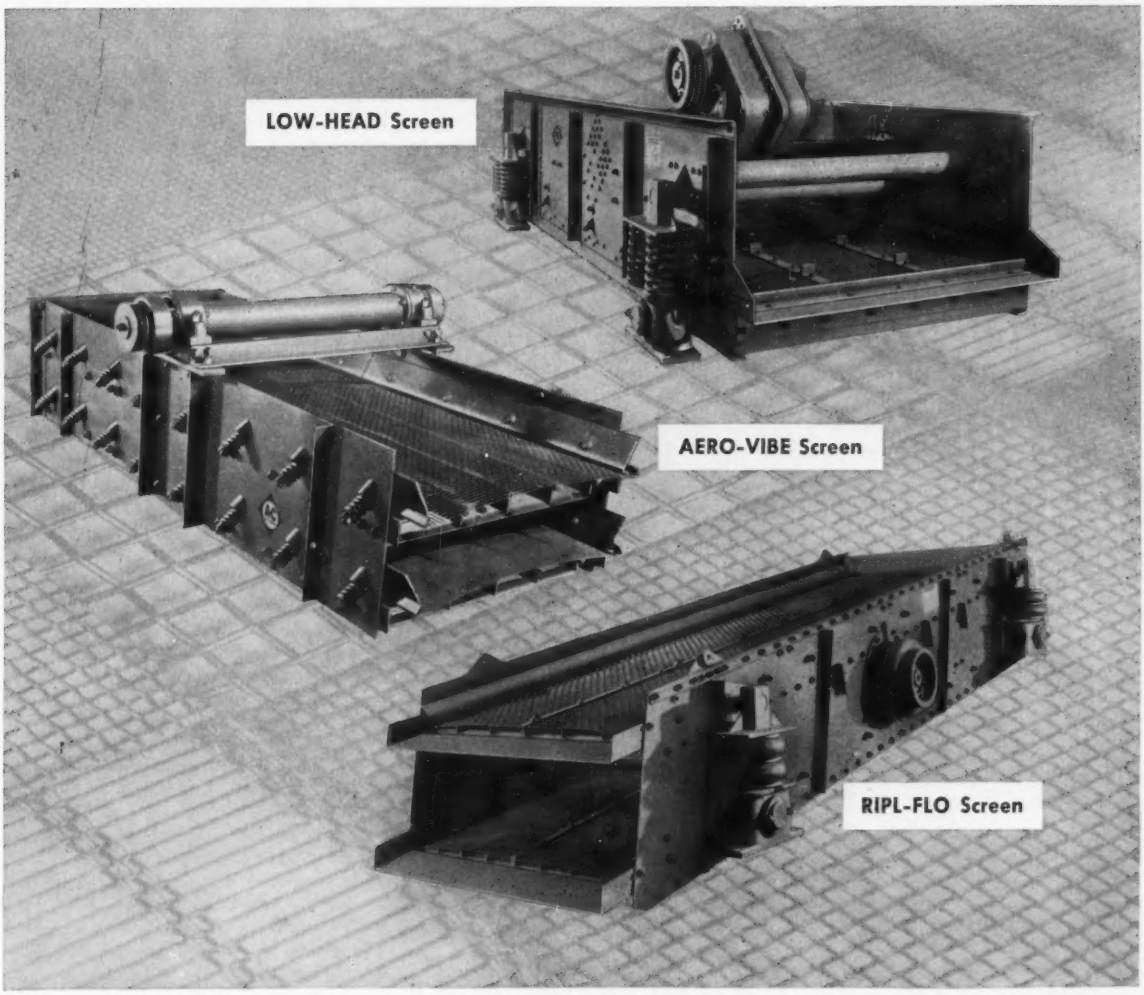
**RUSSIA**—A new hydraulic coal combine, remotely operated and said to be 20 times as efficient as existing machines, is being tested at a mine in the Lugansk region of the Ukraine. According to a story in the *Moscow News,* the combine's capacity is 100 to 130 tph and does away entirely with human labor, except for the remote control operator. Said to be particularly useful in thin seams, the combine, designed by Lenin prize winner Y. Gumennik, "has tracks and moves along the seam at a speed of 100 meters per hour. . . . In contrast to other machines this combine hews the coal by means of the frontal method, using its three powerful cutting parts." Coal hewn by the machine is water-flushed to special ditches from which they are brought to the chamber of the hydraulic hoisting mechanisms.

**AUSTRIA**—United States coal exporters shipped 187,108 metric tons of bituminous coal to Austria during the first quarter of 1960, thus maintaining the level of delivery recorded last year, the Austrian *Statistisches Zentralamt* reports. Rising somewhat in importance as a coal supplier to Austria, the Soviet Union delivered 33,475 metric tons of bituminous (on a per average month basis) during the first quarter of 1960, as compared to 43,401 metric tons in 1959 and 8,625 metric tons in 1957.

**GREAT BRITAIN**—In 2 or 3 yr, Britain's coal industry may experiment with sales of coal or smokeless fuel obtained in 28-lb containers from slot machines at a cost to the consumer of about 3 shillings (42c) a packet, it is reported.

**WALES**—Forty-five men were killed by an explosion 1,000 ft underground at the Six Bells coal mine in Abertillery, Wales. The blast occurred 1¼ mi from the main shaft and sent hundreds of tons of roof rock crashing into the level where the men were working, sealing off their escape route. Rescue teams fought their way through smoke and poisonous gases to reach the victims, and all bodies were recovered.

# ALLIS-CHALMERS




For scalping, sizing, washing, dewatering, media or solids recovery...

## the right screen for you

Depend on Allis-Chalmers for a high-volume, low-maintenance, dependable screen to fit your operation exactly. Whatever deposit you're working, whatever the variation in your product requirements, A-C has the right screen for you.

A-C engineers, working with the industry's most complete line of vibrating screens, are able to evaluate your process without restrictions. Recommendations are completely unbiased ... dictated only by your specific needs.

The result? You get a superior screen, more accurately placed in your system. You make existing as well as new equipment as productive and economical as possible.

Ask your A-C representative about the engineering service that stands behind every A-C screen. Or write **Allis-Chalmers,** Industrial Equipment Division, Milwaukee 1, Wisconsin.

*Low-Head, Aero-Vibe* and *Ripl-Flo* are Allis-Chalmers trademarks. A-1361

**LOW-HEAD HORIZONTAL SCREENS**
for coarse to fine, wet or dry sizing, washing, draining, dewatering and media recovery. Wire cloth, parallel rod or perforated plate surfaces. Maximum aperture, 2½ inches. 1, 2 or 3 decks.

**AVS AERO-VIBE INCLINED SCREENS**
for moderate to fine, wet or dry sizing, washing and dewatering. Top screening at lowest price. Available with wire cloth, parallel rod or perforated plate surfaces. Maximum aperture, 1½ inches. 1, 2 or 3 decks.

**SH RIPL-FLO INCLINED SCREENS**
for light scalping, coarse to fine wet or dry sizing and rinsing. Balanced two-bearing mechanism. Wire cloth, perforated plate or parallel rod surfaces. Maximum aperture, 5 inches. 1, 2 or 3 decks.

with potential savings in fuel cost, we believe, will offer unusual plus advantages to lessors in addition to those of a modern leasing arrangement."

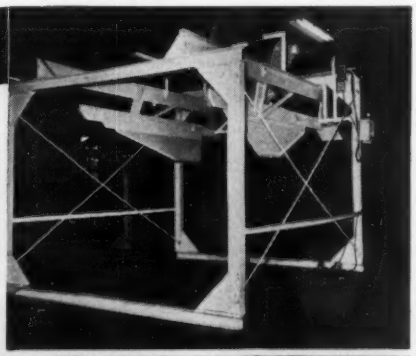
Bureau engineers estimate that in a typical 20-family New York apartment house, annual fuel costs with automatic anthracite will run from $800 to $1700 less than with that of other automatic fuels. They point out that in many instances, savings under existing or contemplated operating costs will more than pay the average monthly charges of $63 during the term of a 3-year contract.

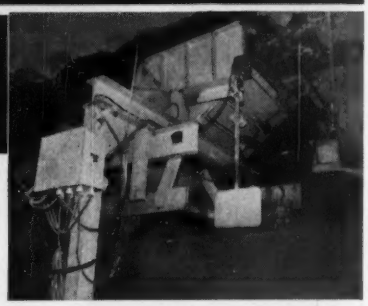
Similarly they estimate that in practically all sections of anthracite's primary marketing area, the northeastern states, automatic anthracite in a typical 16-room school can save from $1650 to $4760 under competitive automatic fuels, once more making it possible to more than absorb average monthly rentals of $108 in a 5-yr contract, and show substantial savings when rentals drop to approximately $20 per month.

Details will be furnished by the Anthracite Information Bureau, 342 Madison Avenue, New York 17, N. Y.


For BIG SAVINGS in Time and Labor Maintenance Expense Installation Cost

Check These Features of the STAMLER Automatic TILT PAN





- It automatically loads entire trip without belt stoppage or spillage between cars.
- It permits use of boom man on productive face jobs.
- It provides uniform car loading without an attendant.
- It can be quickly installed and easily moved.
- It operates with existing car spotters without special hydraulic power units.
- It operates with non-uniform car lengths.
- It is self-adjusting for dented car bodies.
- It automatically shuts down without spillage if the last empty car becomes loaded.
- It fits into the same head room as manually operated flygate chute.
- Fail safe under any emergency.

*Get all the facts on the STAMLER Automatic Tilt Pan. Write today for folder.*

STAMLER Automatic TILT PANS

W. R. STAMLER CORPORATION

PARIS, KENTUCKY

SCHROEDER BROTHERS, Exclusive Eastern Sales Agent Pittsburgh, Pennsylvania

UNION INDUSTRIAL CORP., Carlsbad, New Mexico

SALMON & CO., Birmingham, Alabama

WESTERN SALES ENGINEERING CO., Salt Lake City, Utah


# UMWA Changes Welfare Rules

**Trustees of the UMWA Welfare and Retirement Fund have made the following changes in regulations, effective July 1:**

For hospital and medical care, unemployed miners are eligible only one year after their last regular employment in a classified job in a UMWA contract mine; miners are ineligible "if self employed or in any way connected with the ownership, management or operation of a mine," even though they may be or may have been, performing classified work. The same restrictions apply to funeral expense and survivors' benefits.

In computing eligibility for pensions, an applicant cannot be credited for service in a classified job during a period he was self-employed or was in any way connected with the ownership, operation or management of a mine.

# Tax Deductions Liberalized

**Liberalized tax deductions of exploration expenditures for coal and other mines became the law last month under the President's signature.**

Under previous law, an annual deduction for this purpose was limited to four years at up to $100,000 per year. The new legislation removes the four-year limitation and substitutes an overall limit of $400,000 per taxpayer regardless of the number of mineral properties owned or the number of years involved.

Supporters of the new enactment point out that it is less discriminatory against the small producer whose exploration expenditures might be far less than $400,000 during the old four-year limiting period.

## Equipment Approvals

Joy Mfg. Co.—Type 14BU10-1AF loading machine; five motors, two 20-hp, two 15-hp and one 7-hp; 500-V, DC. Approval No. 2F-1466A, June 14.

J. H. Fletcher & Co.—Four-wheel face drill; one motor, 10-hp; 240-, 550-V, DC. Approvals Nos. 2F-1565 and 2F-1565A, June 21.

National Mine Service Co.—Type 48 TorKar shuttle car; one motor, 60-hp; 250-V, DC. Approval No. 2F-1566, June 27.

Joy Mfg. Co.—Type 60E7P-2 shuttle car; three motors, each 15-hp; 250-V, DC. Approval No. 2F-1567, June 30.

## U.S. Treasury Seeks Income Tax Data

**The Treasury Department is now engaged in surveying the practices and opinions of thousands of firms on depreciation allowances for income tax purposes.**

The Treasury wants statistical information from representative taxpayers to determine how present depreciation provisions are working and what changes might be necessary. Lack of such statistics has made it difficult for the treasury to evaluate recent proposals for changes in depreciation laws.

The Treasury has mailed questionnaires to 2,700 corporations and the Small Business Administration will survey by mail another 8,500 firms. Sen. Harry F. Byrd (D-Va.), chairman of the Joint Committee on Internal Revenue Taxation, urged full and prompt participation from firms receiving the questionnaires. Replies are requested before Sept. 1.

## Carbon Fuel Wins Hanford Contract

**Carbon Fuel Co., Helper, Utah, submitted the low bid on supplying 120,000 tons of coal to the Hanford Works of the Atomic Energy Commission in the state of Washington.**

The bids for the 1961 fiscal year were received July 6. Carbon Fuel bid on coal shipments from its Castlegate, Utah, mines. The AEC indicated that it plans to purchase 320,000 tons, but no more than 120,000 tons from any one bidder. Plans are to purchase 200,000 tons from other bidders in labor surplus areas if they agree to meet the price in Carbon Fuel's bid, which was 30,000 Btu's delivered for one cent.

## President Signs Coal Research Act

**President Eisenhower signed the Coal Research Act July 7, completing the coal industry's long effort for enactment of a federal research program.**

The act authorizes the Secretary of the Interior to set up an Office of Coal Research within the Department of the Interior to develop new and more efficient methods of mining, preparing and utilizing coal.

The Office of Coal Research will contract for, sponsor and promote the coordination of research with associations,

(*Continued on p 56*)

Specially alloyed super-hard and ductile wire... tightly, rigidly woven into screens of ultimate precision. Each is machine leveled for permanent flatness . . . wire ends are sheared, not burnt off, to make screens square and true... then hook stripes are applied with absolute accuracy.

These are but a few reasons L-S Screens have astonishing resistance to wear, breakage, distortion . . . reduce downtime and labor . . . cut the cost of replacements . . . increase production, product uniformity and quality.

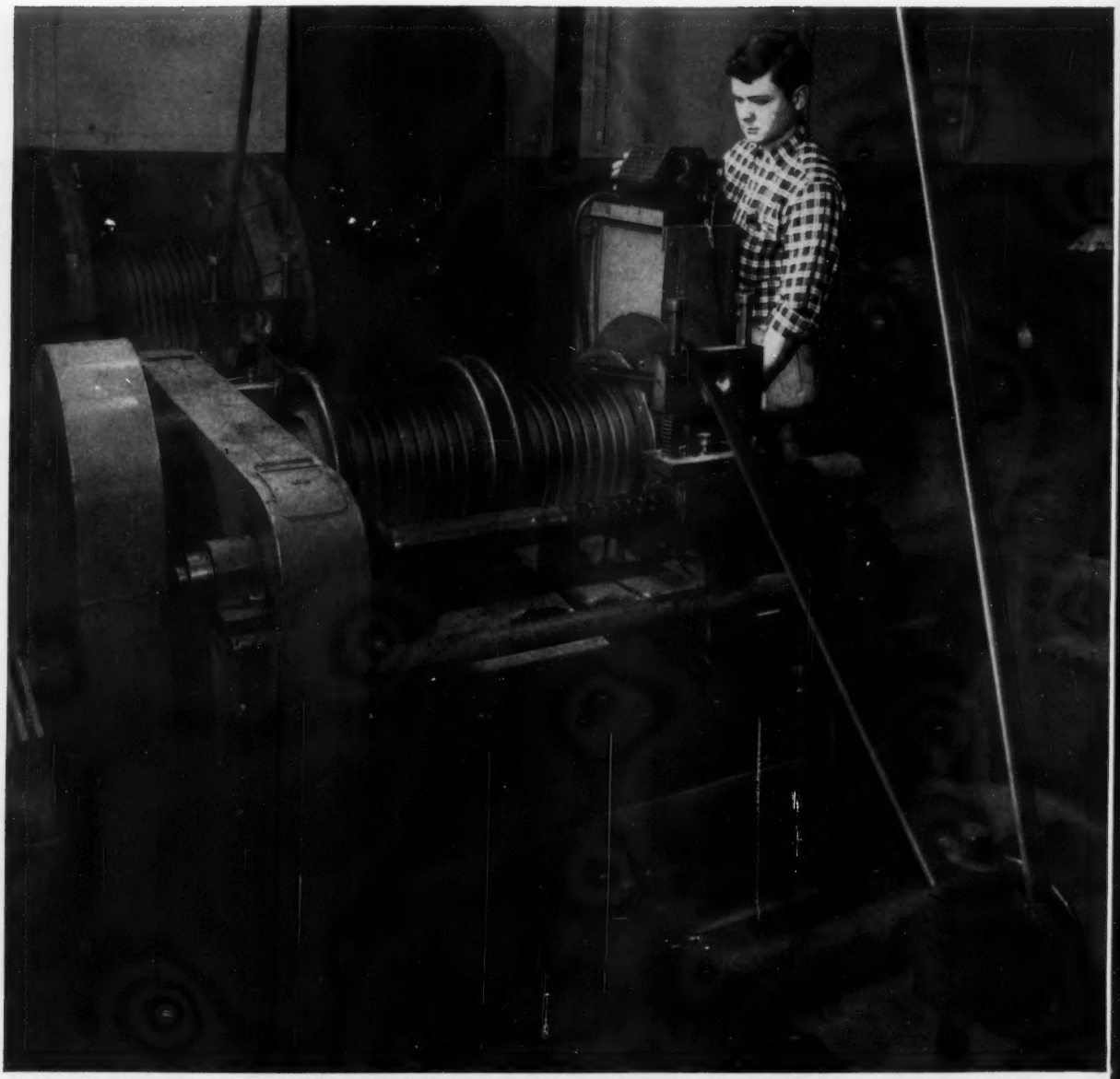
L-S Screens are priced no higher than others but are worth much more. Get the best—order L-S.
*Write for NEW catalog just off the press.*

**IMMEDIATE SHIPMENT—**
*Most weaves and sizes*

Ludloy-Saylor Screens and Wire Cloth can be furnished in any steel including SUPERLOY high carbon, LOUDLOY oil-tempered, stainless or other alloys; Monel, bronze, copper, brass and most other metals that can be drawn into wire.

*FOUNDED 1856*

**LUDLOW-SAYLOR WIRE CLOTH CO. • 4341 WEST CLAYTON AVE. • ST. LOUIS 10, MO.**
LOS ANGELES Star Wire Screen & Iron Works, Inc. (L-S Subsidiary), 2515 San Fernando Rd.
BIRMINGHAM 512 N. 18th St. CHICAGO 6261 West Grand Ave. DENVER 1530 Carr St.
PITTSBURGH Union Trust Bldg. HOUSTON 5638 Harvey Wilson Dr.



**Accelerated testing of cable.** This machine, designed by AS&W engineers, is testing mining machine cable to determine its resistance to reeling and pay off under tension, abrasion, flexing under tension, kinking under tension. Just one of the ways to determine the best insulating and jacketing compounds.

**From portable tools** to the largest power shovels, Amerclad Cables offer safe dependable service.
**It's how you mix** ingredients in just the right proportions that makes a big difference in cable performance.

USS **Tiger Brand Electrical Wire & Cable**

**A standard cable for every special job**

- Asbestos Wire and Cable
- Mold-Cured Portable Cord
- Shovel & Dredge Cable
- Paper & Lead Cable
- Varnished Cambric Cable
- Interlocked Armor Cable
- Special Purpose Wire & Cable
- Aerial, Underground and Submarine Cable

# What's the difference in electrical cable?

## In USS Tiger Brand Amerclad it's better engineering and quality construction

*Engineered for the job.* USS Tiger Brand Amerclad Cables are used in such a variety of applications that "engineering for the job" becomes extremely important. Special constructions are designed for electric shovels, dredges, mining machines, welders and portable tools. Cable life depends on how well the engineers have anticipated all the destructive forces that a cable encounters in service.

*Quality construction.* USS Amerclad's highly flexible construction—rubber insulated conductors and Amerprene jacket—is carefully designed to give you superior electrical performance and mechanical reliability. Dynamically balanced rope lay conductors, as opposed to loosely bunched groups of fine wires, give balanced performance and long, trouble-free service through elimination of unequal tension and elongation.

Each conductor is separately insulated with Amerite, a tough heat-resisting, special rubber compound that exceeds the requirements of ASTM, and other industry standards. A rugged abrasion resisting Amerprene jacket protects the cable from mechanical abuse.

Tiger Brand Amerclad Cables are as tough as they come. They soak up shock and vibration, withstand crushing impact, severe jerking and pulling for unbelievably long periods. Used outdoors for mining, quarrying and excavating machines, Amerclad resists the constant wear and abuse from contact with rocky ground. And installed on lighter indoor equipment—electric welders, shop tools and motor leads—Amerclad gives top performance even when it's dragged over rough floors, through oil, grease or water.

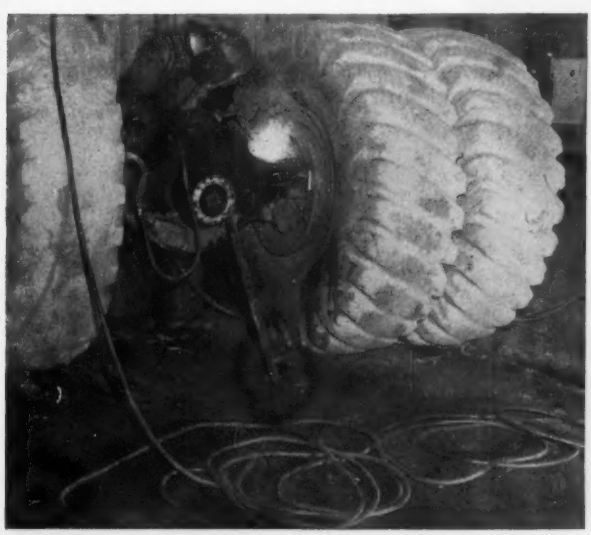
Amerclad's greater durability will pay for itself many times in unfailing service, and ability to handle rated loads. It's the toughest electrical cord and cable money can buy.

*Send for catalog.* The Tiger Brand Amerclad Cable story is told completely in our new book we've reserved for you. We'll send the book without cost or obligation. American Steel & Wire, Dept. 0334, 614 Superior Avenue, N.W., Cleveland 13, Ohio.

USS, Amerclad, Amerite, Amerprene and Tiger Brand are registered trademarks

**American Steel & Wire Division of United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, Distributors Abroad



## News Roundup (*Continued*)

schools and government agencies. It will establish technical advisory committees of recognized experts to evaluate progress and research proposals and to avoid duplication of effort.

## More Research

**Eastern Gas & Fuel Associates is making a major research effort to further extend the applications of its coals in the expanding steel-making field.**

The company's research program is based on recognition that conventional uses of coal offer the best future despite predictions by others about the development of glamorous new products, declared R. P. Tibolt, executive vice president. Mr. Tibolt stated that Eastern's research is "geared to the profitable future" in attempting to find better ways to use its coals in steel-making. The company also is a major producer of steam coal.

Customers, he said, are "increasingly sophisticated people who know a lot about metallurgical coal, who are interested in knowing more, and who rely on technical appraisal of coal and coke and methods of testing that were unknown a few years ago."

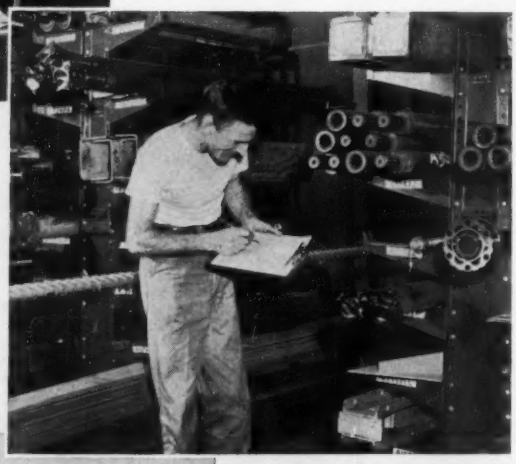
For the purpose of finding better and more economical blends of metallurgical coal for making coke, the Eastern executive pointed out, his company has expanded its coke research facilities into one of the world's finest specialized laboratories.

Referring to predictions about the future of coal, Mr. Tibolt said "much has been written about new uses for coal, about the development of new products such as road materials or exciting new chemicals and derivatives. This has understandably caught the public's fancy, and we ourselves may sometimes be swept along on the tide of public misconceptions. Undoubtedly, some research along the 'new product' lines will bear fruit and Eastern is eager to take advantage of any development of this kind."

He added however that "Eastern's research efforts are concentrated in fields where economists predict the greatest demand for coal will exist in the future.


# GEARED FOR QUICK DELIVERY

**RAMAC** instantly reports availability of your parts anywhere in the eleven warehouse network, and requests shipment from location nearest your mine.



**WAREHOUSE** immediately prepares your parts for shipment to meet deadline set by the mine. Stocks of parts are kept at high levels by immediately requesting replacements from factories.

**TRUCK FLEET** maintains regular delivery schedules to mines in all parts of the country, which are supplemented with special runs in emergencies.

**GENUINE JOY PARTS AVAILABLE AT 11 LOCATIONS:**

Birmingham, Alabama • Carlsbad, New Mexico • Centralia, Illinois • Denver, Colorado • Fairmont, W. Virginia • Luzerne, Pennsylvania • Madisonville, Kentucky • Meadowlands, Pennsylvania • Norton, Virginia • Pineville, W. Virginia • St. Louis, Missouri

**JOY MANUFACTURING COMPANY**


## Screen Buying Guide

An addition to the Screen Buying which appeared in the April *Coal Age* Operating Guide, "Coal Screens and Screening," is the Jeffrey Conveyanscreen. Details on this screen, conforming to the tabulation in the original Operating Guide, are:

| | |
|---|---|
| Manufacturer | Jeffrey Mfg. Co., Columbus 16, Ohio |
| Type or Model | Conveyanscreen |
| Primary Use | General screening, 30M to 1½ in |
| Sizes Available | 1x2 to 4x10 |
| Number Decks | 1, 2 |
| Motion | Straight-line oscillating |
| Drive | Electromagnetic |
| Speed | 3600 vpm |
| Stroke | 1/16 in |
| Inclination | 15-30 deg |
| Horsepower | ⅓-4 |
| Mounting | Vibration - absorber suspension |

## Coming Meetings

**National Safety Congress, 48th annual meeting, Oct. 17-21—Coal Mining Section, Conrad Hilton Hotel, Chicago, Ill.**

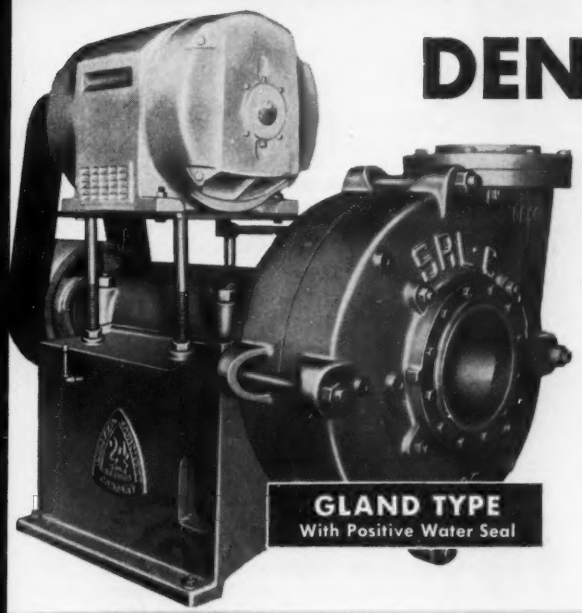
**Biennial Symposium on Drilling and Blasting, Oct. 17-19 — Colorado School of Mines, Golden, Colo.**

**ASME-AIME Joint Fuels Conference, Oct. 24-25 — Daniel Boone Hotel, Charleston, W. Va.**

**Coal Mining Institute of America, 74th annual meeting, Dec. 15-16—Penn Sheraton Hotel, Pittsburgh, Pa.**

# DENVER SRL PUMPS

## Now available in TWO Models




**GLAND TYPE**
With Positive Water Seal

**FOR AN EVEN WIDER RANGE OF PUMPING APPLICATIONS**

**GLANDLESS TYPE**
No Gland—No Sealing Water

### AVAILABLE IN THESE SIZES AND CAPACITIES

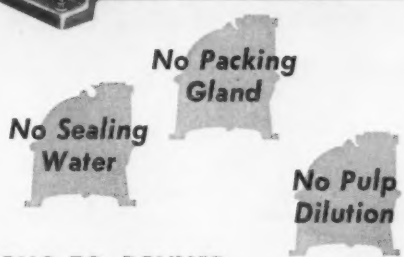
*Specifications and Dimensions*

| Pump Size and Type | Capacity 60' Head RPM | HP | *Water GPM | Dimensions (In.) L | W | H | Approx. Ship. Wt. Lbs. |
|---|---|---|---|---|---|---|---|
| **GLAND TYPE** | | | | | | | |
| 1½"x1¼" | 2190 | 1.9 | 40 | 25 | 17½ | 26 | 525 |
| 2½"x2" | 1500 | 4.9 | 160 | 25½ | 17½ | 26⅜ | 575 |
| 3" x3" | 1400 | 6.8 | 260 | 31¼ | 19¾ | 31½ | 850 |
| 5" x5" | 1060 | 17.4 | 800 | 37¾ | 26¼ | 36½ | 1550 |
| 6" x6" | 1170 | 36.3 | 1600 | 45¼ | 28½ | 46½ | 2300 |
| 3" x3"—C | 1450 | 8.2 | 260 | 37½ | 21½ | 33¾ | 1240 |
| 5" x4"—C | 1035 | 12.6 | 700 | 40¼ | 27 | 37⅜ | 1600 |
| 8" x6"—C | 920 | 39.8 | 1600 | 63 | 36½ | 49¼ | 4375 |
| 10" x8"—C | 820 | 74.0 | 3300 | 68¾ | 43 | 57 | 5100 |
| 12" x10"—C | 615 | 115.0 | 5000 | 69⅝ | 46½ | 63 | 5900 |
| **GLANDLESS TYPE** | | | | | | | |
| 3" x3"—C | 1450 | 10.0 | 180 | 37½ | 21½ | 33¾ | 1240 |
| 5" x4"—C | 1035 | 15.0 | 500 | 40¼ | 27 | 37⅜ | 1600 |
| 8" x6"—C | 920 | 47.0 | 1200 | 63 | 36½ | 49¼ | 4375 |
| 10" x8"—C | 820 | 87.0 | 2700 | 68¾ | 43 | 57 | 5100 |

*Based on water. Multiply horsepower by specific gravity of pulp to obtain actual brake horsepower.

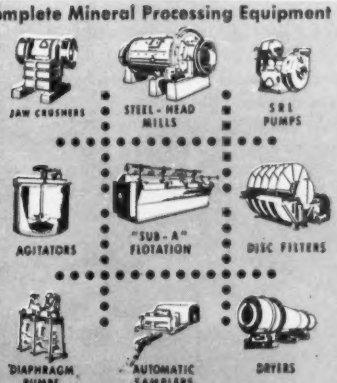
### DENVER "TRU-GLANDLESS" SRL PUMP...
### A MAJOR ADVANCE IN PUMP DESIGN

DENVER SRL Pumps with positive water seal already have a world-wide reputation for their high efficiency, low part cost, long life. If dilution of pulp or slurry is a problem, you now get the extra advantage of "TRU-GLANDLESS" construction. Requires no sealing water, no packing glands, eliminates pulp dilution.




***SEND DETAILS OF YOUR PUMPING PROBLEMS TO DENVER***

**Complete Mineral Processing Equipment**




*"The firm that makes its friends happier, healthier and wealthier"*

DECO ENGINEERS — STANDARD RELIABLE 24 HOUR SERVICE EFFICIENT

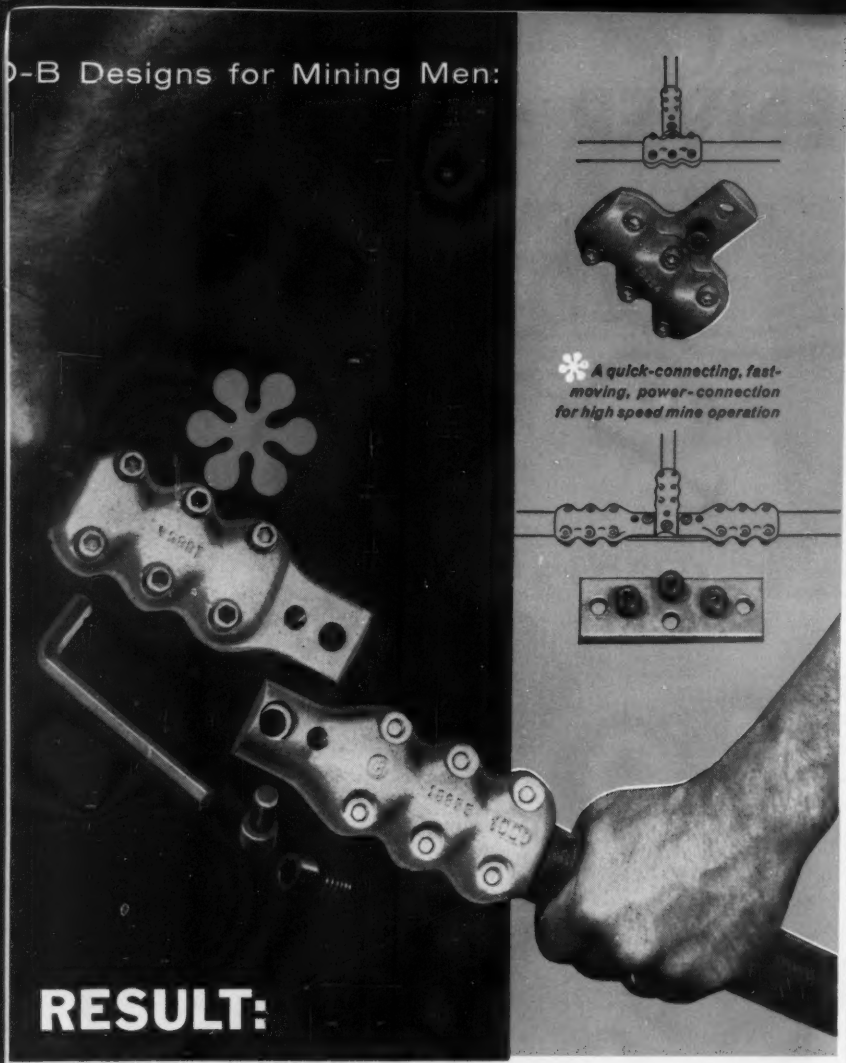
# DENVER EQUIPMENT COMPANY

Cable DECO DENVER — Phone CHerry 4-4466

1400 Seventeenth St. — Denver 17, Colorado

- **NEW YORK CITY** 4114 Empire State Bldg. Phone CH 4-6510
- **BLUEFIELD, W. VA.** P.O. Box 1536 • Phone DAvenport 5-6598
- **TUCSON, ARIZ.** 3437 E. Camden St. • Phone EAst 6-7282
- **LONDON** 13-17 Christopher St., Finsbury Sq. Phone Bishopsgate 3575
- **JOHANNESBURG** Broadway and Ninth Bez Valley • Phone 25-7331
- **TORONTO** 185 Bay Street Phone EMpire 3-8836
- **VANCOUVER** 802 Credit Foncier Bldg. Phone MUtual 3-7595
- **MEXICO CITY** Avenida Juarez 14, Desp. 615 Phone 21-1477
- **LIMA** Marquinarias 270 Casilla 4950 • Phone 41887

-B Designs for Mining Men:




**You can make connections between seven popular sizes of copper or aluminum cables... joining the same or different sizes ...either copper or aluminum**

**FAST**... The new O-B Cable Connector makes or breaks a cable connection simply with the turning of two cap screws. These sturdy fittings are especially designed for sections that are picked up and moved frequently.

**VERSATILE**... You can add or remove sections of cable to keep pace with fast machinery. You can make tap-offs, 3-way connections between cables, or a variety of switch and panel arrangements... all in minutes!

**SIMPLE**... Your O-B Cable Connectors give you the advantages of "built-in" cable connections that hook-up or disconnect simply. No specialist needed... saves time and labor on the job.

Write us... or see your local O-B sales-engineer to order the new O-B Cable Connectors. You'll find—as others have—that they make moving easier, faster, and considerably cheaper. OHIO BRASS COMPANY—MANSFIELD, OHIO, Canadian Ohio Brass Company, Ltd., Niagara Falls, Ontario.

Ohio Brass

HOLAN

EXPANSION SHELLS AND PLUGS • LINE MATERIALS • SAFETY AND CONTROL EQUIPMENT • ELECTRIC HAULAGE MATERIALS

10051-M




## Conveyor Galleries

**D. J. Heath, divisional engineer, Link-Belt Co., Chicago, Ill., in commenting on the feature in the June, 1960, issue describing tubular conveyor galleries at U. S. Steel's Maple Creek plant, writes that Link-Belt designed its first tubular gallery for Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., in 1954.**

*Coal Age* in June (p 94) reported that the Maple Creek installation was the "first application of smooth, tubular steel, prefabricated conveyor galleries in any industry."

The Wisconsin Rapids galleries were fabricated of smooth ¼-in plate. Link-Belt has furnished tubular galleries for three other customers since that time, Mr. Heath continues, including the latest at Froedert Malt Co., Milwaukee, Wis., which was erected in July, 1959. The conveyor stringers, etc., were completely prefabricated. The tube is 7 ft 2½ in in diameter, skin plate is 3/16 in thick, span is 110 ft.

We agree that tubular galleries have many advantages, Mr. Heath says, but cannot understand your statement that a tube can span greater distances than a rectangular gallery (June, p 97). "I believe you will find under investigation that using an articulated truss conveyor gallery of rectangular cross section, and comparing the weight of structural steel per foot with the steel used in the tubular galleries you described, the articulated truss would be more economical for the 110-ft spans listed," Mr. Heath concludes.

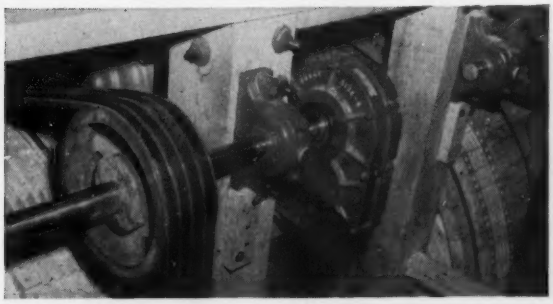
## Bethlehem Wins

**The first three prizes went to first-aid teams of Bethlehem Mines Corp. in Central Pennsylvania Safety Association's 23rd annual first-aid meet July 16 at Nanty-Glo, Pa.**

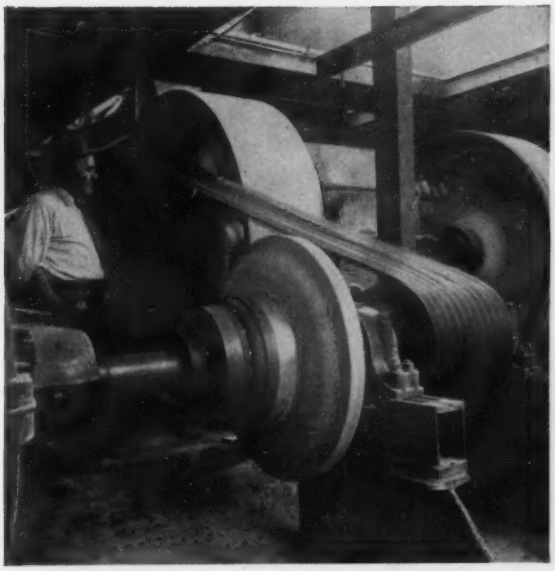
First-place honors, including a $350 cash award and a plaque presented by Mine Safety Appliances Co., went to the Franklin mine team. Revloc mine team placed second, earning $175 and the Central Pennsylvania Coal Producers' Association trophy. Third place went to the Rosedale mine team along with $140 and the UMWA trophy.

Flashlights, presented by the Dept. of Mines and Mineral Industries, went to Springfield mine No. 4, Barnes & Tucker Co., for fourth place. Heisley mine, Bethlehem Mines Corp., won fifth place and safety caps presented by Bituminous Casualty Corp. Sixth place earned Mine No. 15, Barnes & Tucker Co., lights presented by Old Republic Insurance Co.

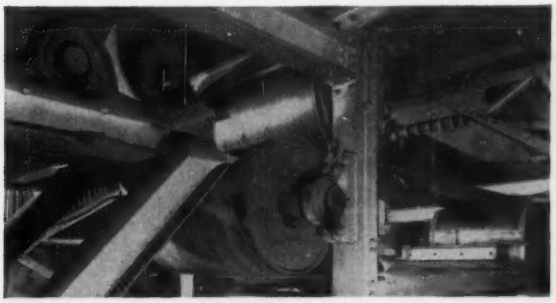
# How Dodge pillow blocks with Timken® bearings give longer life with less maintenance



**1. Two 2⅞" Dodge Special Duty** pillow blocks equipped with Timken® tapered roller bearings, support the line shaft driving six by eight foot tanning drums. The tapered design of Timken bearings enables them to take both radial and thrust loads in any combination.



**2. The crusher** at a trap rock and asphalt plant runs faster, gives more production now that Dodge Double Interlock pillow blocks on Timken bearings are installed. The Timken bearings in these blocks give full-line contact between rollers and races for greater load carrying capacity.



**3. The Timken bearings** in All-Steel Dodge pillow blocks must stand up under adverse operating conditions found when sintering metals. One major advantage of Timken tapered roller bearings is their ability to hold housings and shafts concentric, thus keeping lubricant in, dirt and dust out.

The photo at right shows the Dodge All-Steel pillow block Timken bearing equipped. The specially designed bearing has a tapered bore with self-aligning spherical outer surface—never needs adjustment.

There's a Dodge pillow block equipped with Timken bearings to fill every engineering need: All-Steel, Type "E", Double-Interlock, Type "C" and Special Duty. And with Timken bearings, space consuming thrust devices are not needed. Look for Timken bearings in all the machines you buy or build. They're the symbol of quality. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits. Canadian Division: Canadian Timken, St. Thomas, Ont.

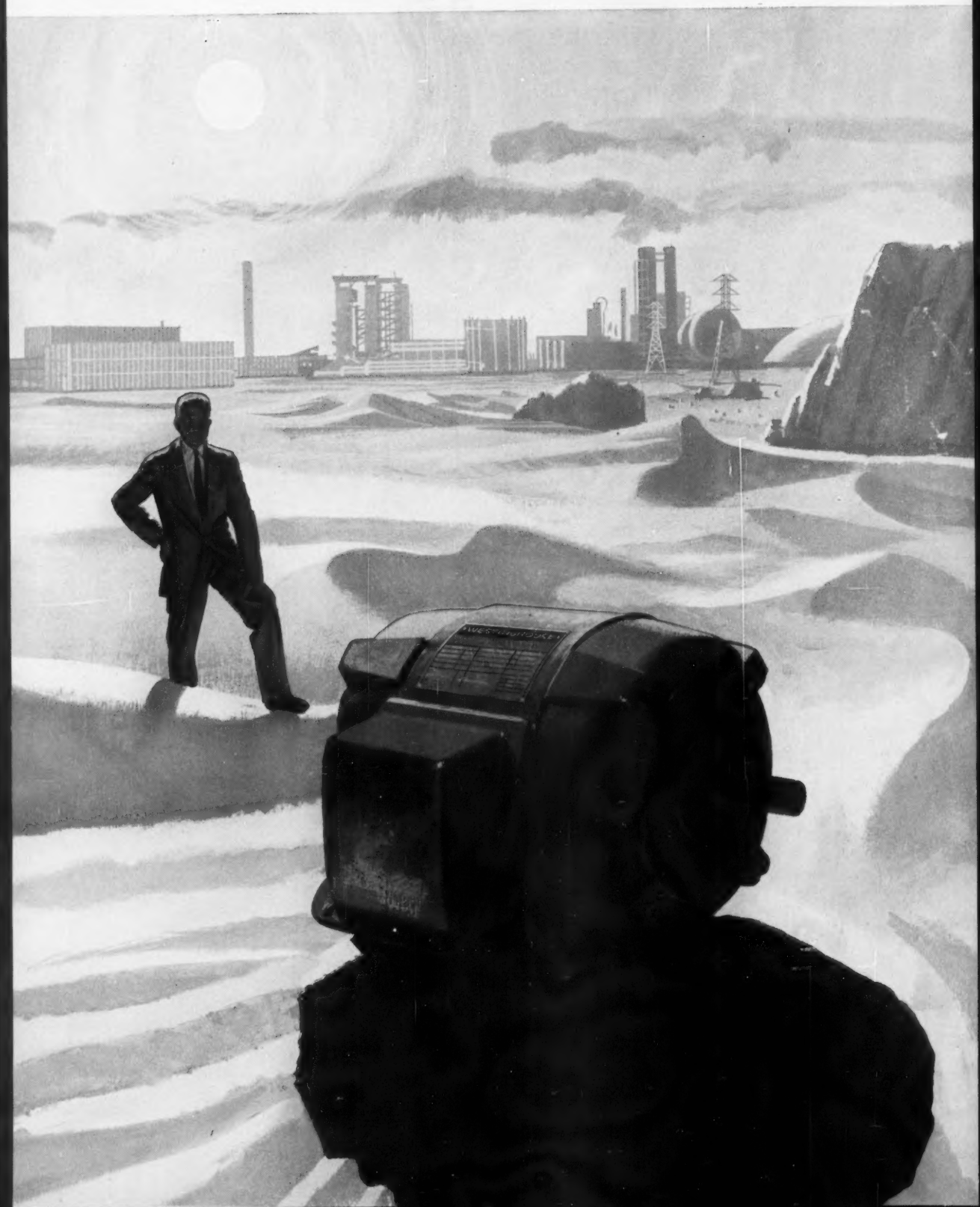
**Industry rolls on**

**TIMKEN®**

**tapered roller bearings**

*New Guardistor*

# THE MAN & THE MOTORS



# FROM WESTINGHOUSE

## *Guardistor* motors let you match the full capability of the motor to the job— with complete safety—absolute confidence

**Our Marketing Manager says:**

- "You can match the motor to the load . . . use all the motor you are paying for.
- Provides positive protection based on winding temperature . . . *not* load current and/or power supply fluctuations.
- Eliminates time and expense of changing winter-summer heaters. No nuisance tripping, it's fail-safe . . ."

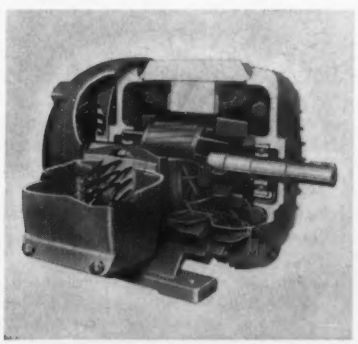
**Our Engineering Manager says:**

"With the breakthrough development of the Westinghouse Positive Temperature Coefficient thermistors, for the first time we can provide inherent protection against motor failure caused by excessive heat. The solid-state thermistors buried in the windings instantly sense excessive heat from any cause and simultaneously warn of trouble or automatically take the motor off the line. Thus, motor protection is placed where only true motor protection can be . . . in the windings."

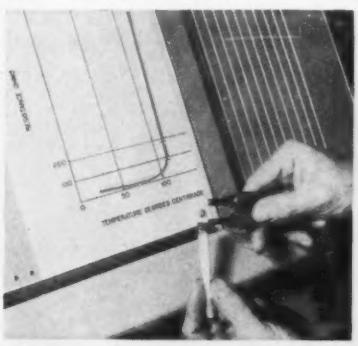
Call your Mr. Westinghouse for the application of a Guardistor* motor to your drive requirements . . . write for *Questions and Answers About . . . Guardistor* (B-7876). Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

*Trade-Mark

J-22160



Unlike remotely located sensing devices, PTC thermistors are buried in the windings of the Guardistor motor, instantly equating all temperature factors.



Ever alert PTC thermistors constantly totalize temperature, statically triggering an action *only* if critical temperature is reached.

MOTOR & GEARING DEPARTMENT

YOU CAN BE SURE...IF IT'S

# Westinghouse

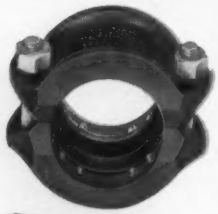
EASIEST WAY TO MAKE ENDS MEET

VICTAULIC®

The Time-and Job-Proven Method of Reducing Piping Costs

NEW PLAINLOCK COUPLINGS AND FITTINGS

For Low Cost Jointing of Plain End Pipe



- Speed Installation — Save Time and Labor — Cut Piping Costs
- No pipe end preparation
- Positive grip of pipe ends
- Low cost couplings and fittings
- Join standard or light wall carbon or stainless steel, aluminum and other piping materials

CUT COSTS WITH OVER 1100 VICTAULIC ITEMS FOR BETTER AND EASIER PIPING

For complete information on any Victaulic product, write:

VICTAULIC COMPANY OF AMERICA

Dept. 2-8, P.O. Box 509, Elizabeth, N. J.




# Mines, Companies

**Peabody Coal Co.'s Mine No. 17 may be sold for development into an industrial area, Stillman Elfred, chairman of the company, announced recently.**

The possible purchaser, Mid West Construction Co., a Canadian firm, plans factory sites on the 400-acre property and a residential area near a 50-acre lake on the site, according to the firm.

**The St. Ellen coal mine, said to be the last large shaft mine in St. Claire County, Ill., has been closed by owner Peabody Coal Co.**

A spokesman for the firm said that although St. Ellen has been producing

## Preparation Facilities

**Leckrone Coal & Coke Co., McClellandtown, Pa.**—Contract closed with Jeffrey Mfg. Co. for one comp't. diaphragm jig, 75 tph, to handle 5x0 coal.

**Imperial Smokeless Coal Co., Quinwood, W. Va.**—Contract closed with Eimco Corp., through Roberts & Schaefer, for two 10½x12-ft Agidisc Filters, one for flotation concentrate and one for refuse thickener underflow; one 100-ft diameter thickener for froth cell tailings; and one 18-ft diameter thickener for magnetite.

**Crystal Block Coal & Coke Co., Sarah Ann, Logan County, W. Va.**—Purchase authority granted to The Daniels Company for a DMS dense media coal preparation plant.

**Winding Gulf Coals, Inc., Tams, W. Va.**—Joint contract closed with Fuel Process Co. and J. O. Lively, Inc. for one heavy-media coal preparation plant. Equipment to be installed at East Gulf mine, East Gulf, W. Va., will include a 250-tph primary heavy-media coal washing plant and a 90-tph secondary heavy-media coal washing plant. Products to be treated are 8x$^{3}/_{16}$-in coal separated at 1.40 specific gravity at rate of 250 tph, 1.40-160 specific gravity middlings product and 1.60 sink refuse product.

**Joanne Coal Co., Rachel, W. Va.**—Contract closed with Link-Belt Co. for a froth-flotation addition to handle 45 tph of fine coal. Completion, November, 1960.

**High Splint Coal Co., High Splint, Ky.**—Contract closed with Mechanical Equipment & Construction Corp. for storage and blending facilities of 2,000-ton capacity to be completed Aug. 31, 1960.

in excess of 1 million tons of coal a year, "the company has found that its operation in recent years has been unprofitable." The mine had been operated for 50 yr.

**Wildwood mine of Butler Consolidated Coal Co. has been leased to the Rochester & Pittsburgh Coal Co., Indiana, Pa.**

The mine will be operated as the Wildwood Coal Co., Div. of Rochester & Pittsburgh.

**W. A. Haslam, president of The New River Co., has signed a contract allowing the city of Beckley, W. Va., to develop a portion of the Sewell coal seam as an exhibition mine.**

The city is expected to produce about 1,500 tons of coal in the process of developing the mine, located in New River Park.

**The Lehigh Navigation-Dodson Co., Bethlehem, Pa., has announced construction of the Greenwood Breaker on the site of the old Tamaqua, Pa., breaker.**

Designed and being erected by the D. & K. Construction Co., Inc., McConnellsville, Ohio, the operation is scheduled for completion by late summer. The breaker will have a capacity of 4,500 tons per double shift and nine pockets with a total storage capacity of 2,500 tons of clean coal. It will employ the most modern and advanced techniques for cleaning and sizing of anthracite and will include breaker equipment of Western Machinery Co., T. J. Gundlach Machine Co., Allis-Chalmers Mfg. Co. and Stearns Magnetic Products. Both rail and truck coal can be antifreeze or oil-treated. Coal shipped from the breaker will originate at Greenwood, Pa.

## Bituminous Output

| YEAR TO DATE | PRODUCTION |
|---|---|
| July 16, 1960 | 223,126,000 |
| July 18, 1959 | 222,463,000 |

1960 output 0.3% ahead of 1959.

| WEEK ENDING | PRODUCTION |
|---|---|
| July 16, 1960 | 7,280,000 |
| July 18, 1959 | 7,342,000 |

## Anthracite Output

| YEAR TO DATE | PRODUCTION |
|---|---|
| July 16, 1960 | 9,216,000 |
| July 18, 1959 | 10,841,000 |

1960 output 15.0% behind 1959.

| WEEK ENDING | PRODUCTION |
|---|---|
| July 16, 1960 | 340,000 |
| July 18, 1959 | 374,000 |

- Steel Construction
- Mica Insulation
- Corrosion Resistant
- Vibration Proof
- Moisture Resistant
- Provision for Expansion
- Adequate Ventilation
- Rugged Terminals

By use of those durable raw materials . . . steel and mica, and the P-G exclusive features of design, these steel grid resistors have the "built-in quality" to overcome factors which often cause resistor failures. Vibration, moisture laden or corrosive atmospheres have little effect on continuity of service. Try Post-Glover Resistors for heavy duty applications where resistors are subject to severe service . . . continuous "Trouble-Free" performance is assured.

P-G

*The Nonfreezable Steel Grid Resistor*

THE **POST-GLOVER** ELECTRIC COMPANY
OFFICE and FACTORY—Kenton Lands Road, Erlanger, Kentucky
MAILING ADDRESS—Box 709, Covington, Kentucky

# America's Newest Major Coal Mine

*(Its Continuous Borers and* ROPEBELT® *Conveyors—all by Goodman)*

Typical scene at Old Ben Coal Company's new No. 21 mine near Sesser, Illinois. Coal is carried by Goodman ROPEBELT Conveyors. 36 inch units traveling 450 feet per minute are used in the panels. Goodman 42 inch units, traveling 600 feet per minute, are used for the mainline.

® *Registered trademark*

Goodman Continuous Borers are being used for all development work now and full production work later. The borers develop an arched entry 7 feet high and 13 feet wide. Capacity of each Borer is 8 to 10 tons per minute.

In this new preparation plant, Old Ben No. 21 employs both wet and dry cleaning to produce low-sulphur metallurgical coal. The product will meet the growing needs of the Midwest's expanding steel industry, as well as those of utilities, factories, and domestic users.

*Excerpts from coal industry's leading publications*

## RESULT OF FORESIGHT

Old Ben No. 21, newest major deep-shaft coal mine in Illinois, is located in a 100-million ton reserve of metallurgical coal acquired in 1918 in anticipation of demands of today's industrial markets. With a potential capacity of 15,000 tons per day, it joins the ranks of the nation's largest producing mines.

## HOW COAL IS MINED

Coal is mined with Goodman Continuous Borers which develop an arched entry 7 feet high and 13 feet wide in the 9 foot seam. Maximum capacity is 8 to 10 tons per minute. Like all production machines in the mine, the Goodman Continuous Borers employ 440-volt a-c power. Two 100-hp motors power the twin cutting arms, and a 50-hp motor powers the tramming and hydraulic systems. *When the mine is in full production, eight Goodman Continuous Borers will be in use.*

Each continuous borer is served by three shuttle cars, with a capacity of eight tons per car.

## HAULAGE SYSTEM

The shuttle cars discharge to 36 inch Goodman ROPEBELT Conveyors, unloading over either the sides or end of the conveyor, whichever is most convenient. The 36 inch conveyors discharge to the 42 inch ROPEBELT conveyors of the main haulage system.

An interesting feature of this Goodman conveyor system is that most units are suspended from the mine roof rather than being mounted on supports on the mine floor. This is because of the weak nature of the seam floor, which tends to "heave" following extended exposure and weight.

Originally it was planned to suspend only the main 42 inch belts in this fashion, but the success of the method, coupled with better self-alignment of bottom idlers because of freedom to swing and thus train automatically, plus the speed of installation, caused management to employ the same method with the 36 inch conveyor units.

The conveyors are suspended from 5 foot roof bolts. Use of a special sliding bearing plate and hanger on these bolts make perfect alignment of the support bolts unnecessary, as the plates can be adjusted within a range of six inches as necessary when installing and aligning the conveyor.

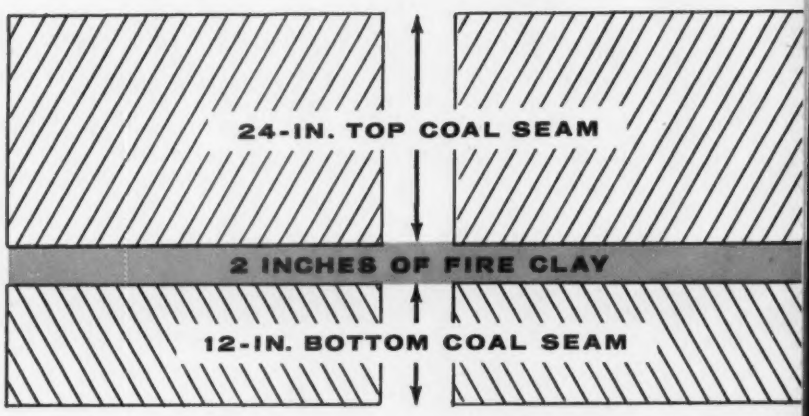
*This is mining's new look aboveground and underground. Let us arrange for you to see Old Ben's No. 21 in action.*

**GOODMAN**
MANUFACTURING COMPANY
Halsted Street and 48th Place, Chicago 9, Illinois

CUTTING MACHINES • CONVEYORS • LOADERS
SHUTTLE CARS • LOCOMOTIVES • CONTINUOUS MINERS

# How KIRKVILLE COAL COMPANY solved split coal seam problem

## *and reduced ash content with SKOOPER loading...*




Study the diagram. You'll quickly see the coal-clay-coal loading obstacle at one of Kirkville Coal Company's open pit mines in Missouri, near the Iowa state line. The 2-inch layer of clay splits a 36-inch vein of high-quality bituminous coal. Mixing in clay during coal loading causes too high an ash content . . . lowers B.T.U., and reduces market price.

### As President C. E. Hanson puts it:

"Split veins in this area have always made it all but impossible to remove coal without getting a high percentage (7 to 8%) of ash due to the clay seam. Standard shovels with coal-digging buckets heeled into the clay, while tractor-type and 4-wheel-drive front-end loaders constantly dug into the clay with their tractive systems."

### He further reports . . .

"Koehring Skooper proved to be the ideal machine for the job. With its 7-foot level crowd, clean coal can be shaved off *with 2% less ash.*" What's more . . . Skooper's powerful break-out force, coupled with level crowd action, makes digging the coal an easy job. Consider this, too . . . Skooper's 2-yard bucket (on basic ½-yard machine) takes full advantage of only 64 horsepower . . . makes the most efficient use of the little fuel it consumes! That's because, with Skooper's unique "stand-still" loading cycle, full engine power is concentrated on the digging effort . . . and not on unnecessary traveling.

### 5 months with no down-time

"Since the start of our busy season 5 months ago, the Skooper has worked 8 hours a day, at least 5 days a week without a single hour's down-time," Mr. Hanson reports . . . and adds, "For coal digging and loading, I feel that it's the most efficient equipment on the market!" Isn't it time *you* tried Skooper? Call Koehring distributor, or write us about it today.

*See your distributor about the Koehring Equipment Show. Waukesha, Wisconsin. Week of September 19.*

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

*There's nothing like it— on wheels or tracks!*

***Koehring 1205 strips Kirkville coal***

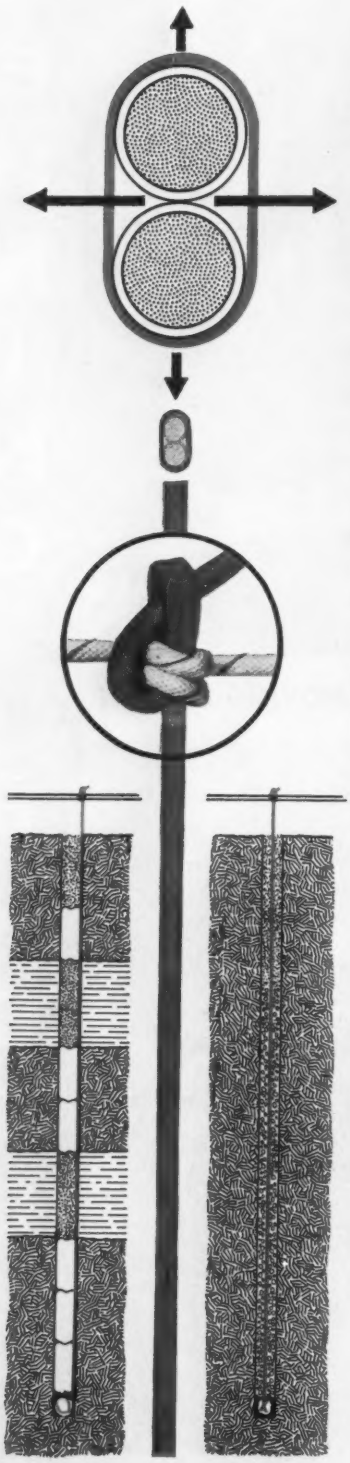
Working just ahead of Skooper at 3,000-acre Kirkville mine, this Koehring® 1205 is stripping approx. 24 feet of overburden. Materials range from common earth and clay to shale and ledge rock. 1205 output? About 4300 yards per 16-hour day! It's equipped with 3-yard dipper on 40-foot boom, 30-foot stick . . . has been stripping at Kirkville mines for over 2 years. K24

**MAKES 7-FOOT LEVEL CUT... SWINGS, LOADS OUT... WITHOUT MOVING TRACKS!**

# KOEHRING® SKOOPER

KOEHRING HEAVY DUTY

# You can save money by using this New 50 DUPLEX* PRIMACORD®



**. . . wherever you are now using conventional 150-175 grain nominal coreload detonating fuse as sole initiator for certain types of uncoated AN-Fuel Oil mixtures**

**Extensive testing has established enhanced directional initiating strength from the twin cavities of the Figure 8 cross-section.**

New 50 DUPLEX Primacord consists of two 50-grain Primacords laid side by side and covered with a bright red plastic jacket. This construction develops a Figure 8 cross-section of the two cords forming two opposing V-shaped cavities which run beneath the jacket for the full length of the cord. This construction provides directional initiating strength effectively equivalent to that of 150-175 grain nominal coreload detonating fuse with single core.

| Primacord | Total Coreload | Major O.D. | Minor O.D. | Tensile Strength | Weight (Per M Ft.) |
|---|---|---|---|---|---|
| 50 DUPLEX | 100 Grain ±10% | .323" ±.008" | .178" ±.008" | 170 lbs. | 24 lbs. |

**Advantages of 50 DUPLEX PRIMACORD**

*Less expensive* than either the 150 or 175 grain detonating fuse with single core.

More flexible and lighter in weight.

Furnished in 500-ft. lengths. Does not need end seals — can be cut and applied in the field as easily as the standard types of 50-60 grain Primacord.

Easier to connect to Primacord trunklines with tight knot connections.

50 DUPLEX PRIMACORD is initiated with fuse and cap or electric blasting caps, or through proper knot connections to trunklines of Plain, Reinforced or Lo-Temp Primacord.

**Warning:** 50 DUPLEX PRIMACORD is recommended as the sole means of initiation only for certain types of uncoated prill-oil mixtures, or wherever 150-175 grain nominal coreload detonating fuses with single cores are now being used *successfully* for direct initiation of such mixtures. In case of doubt consult your explosives supplier or communicate with this company.

## The ENSIGN-BICKFORD COMPANY

*Simsbury, Connecticut • Since 1836*

DU-1

Devoted to the Operating, Technical and Business Problems of
The Coal-Mining Industry

COAL AGE

AUGUST, 1960

IVAN A. GIVEN, EDITOR

# Basically Favorable

CAN A COAL SLURRY—40% water and 60% coal—be burned directly and economically? Can natural gas be liquefied and stored on the surface at consuming centers in times of slack demand—again economically? Can an oil jobber really live up to a contract to supply a major utility its full fuel needs at a guaranteed differential under coal, regardless of what the coal price is?

These questions reflect the fact that thinking and action are taking place along these lines, in turn reflecting the fact that the fuel and energy market is in an increasing state of flux. One reason is coal's emergence as a low-cost supplier, in contrast to the increases in competitive prices. In addition, the competition also finds itself, for perhaps the first time in history, afflicted with a considerable excess capacity. When prices are rising, as coal has found out in the past, excess productive capacity multiplies the competitive difficulties.

This is not to infer that coal has polished off the opposition. In fact, the methane liquefaction idea and guaranteed-differential oil contracts are evidences that there will be no easy giving up. But they cost and since coal prices set the ceiling they mean a reduced net for the competitive dealer over the long run, and perhaps even the short, though dumping may win a temporary advantage and momentarily distort the basic picture.

The pressure to cut prices and to dump will, in fact, increase, along with intensification of the search to cut the costs of transporting, handling and storing oil and gas—an area in which coal has long been active and where additional progress can be made, perhaps in burning natural slurry straight from the pipeline, possibly in further bulk rail rates, and so on. And coal still can hold its mine prices down to present levels for a long time to come, while competitive costs will continue to increase in the foreseeable future.

Summing up, things are slow at the moment and competition is still rough and may, if oil and gas interests get desperate, get rougher, but coal's basic cost advantage still operates powerfully in its favor, giving extra effect to the continuing improvements in merchandising, service, lower transportation costs and other steps leading to greater consumer satisfaction.

# The Ultimate

MECHANIZATION contributes to safety, but does automation? This question has been raised by at least one union official, according to newspaper quotes. Perhaps there is a point here worthy of consideration, though it is difficult to see how automation, in its commonly accepted sense of a man reading dials and pushing buttons at a central point, could adversely affect safety. The number of men exposed to hazards would be definitely less, which has been the story of machine mining, while the operator, in a central, better protected spot under complete automation with fully remote control, certainly should be less likely to meet with injury. In fact, remote control of mining would at one stroke eliminate a big share of coal's injuries and fatalities—those resulting from falls. Conclusion? Automation, as the ultimate stage of mechanization, should provide the ultimate in safety.

## UMWA Develops Marketing Program . . .

### 1. By Establishing Labor Peace . . .

*IN NOVEMBER, 1956, Edward G. Fox, president, BCOA, and John L. Lewis, then president, UMWA, concluded another peaceful wage boost. Following the event, Mr. Lewis stated: "For 6 yr now there have been no major stoppages in the industry, and for an indefinite period into the future that will continue, providing the leaders of the industry exercise that discretion and judgment they have now exhibited that they possess. . . . Abatement of national conflict in the coal industry is giving the industry time for reorganization of its productive and marketing practices and policies."*

### 2. By Promoting Export . . .

*AMERICAN COAL SHIPPING, Inc. was formed June, 1956, to control overseas freight rates and promote the U. S. export trade. The action marked the first time that producing and exporting companies, the UMWA and principal coal-carrying railroads banded together on "equal terms" in a joint merchandising venture. Mr. Lewis is pictured above with other principals involved in the undertaking: R. E. Salvati, president, Island Creek Coal Co. (left), Walter Tuohy, president, Chesapeake & Ohio Ry., and the late Richard L. Bowditch, chairman of the board, C. H. Sprague & Sons.*

# UMWA: New Force for Coal

In a pioneering union activity, the UMWA has launched a virile program to build industry competitive strength, aid search for new markets. Goal: To match postwar gains in productivity with equivalent in marketing.

By **W. A. Raleigh Jr.**
Associate Editor, *Coal Age*

FOR THE THIRD TIME in postwar years, John L. Lewis has originated a major new policy for the United Mine Workers of America, and, at the same time, for the entire American labor movement. That policy—developed in well planned stages as pictured in the photos above—is dedicated to maximum cooperation with coal management in its drive to match major gains in productivity with equivalent gains in market development.

Developing new labor policy, of course, is relatively "old hat" for Mr. Lewis.

It was Mr. Lewis who originated the idea that a labor union should practice maximum cooperation with management in modernizing productive facilities. To coal management during the past 15 yr, this has meant an increase in average miner productivity from 6.3 to 12.6 tpd. In turn, this has provided the key to keeping the average F.O.B. mine price of coal down to less than $5 per ton—a feat almost unique in American enterprise.

It was Mr. Lewis again who pioneered in providing a nationwide system of total, "cradle-to-grave" medical and hospital service for coal miners and their families. For coal management and labor during the past 12 yr, a *Coal Age* survey showed this program has brought mutual benefits in conserving human resources and skilled labor vital to high productivity (August, 1958, p 72).

Despite these major contributions to total industry progress, Mr. Lewis has never been one to rest on past laurels. With characteristic vision, early in the 50s, he saw there was still great need for another cooperative effort with coal management—this time in market development.

The need was apparent through observing the industry's production-sales record, which was consistently falling short of predicted potentials.

The need was also apparent through noting persistent difficulties experienced by industry leaders in overcoming the rugged individualism which has traditionally characterized company marketing practices and retarded all-work attack on competition.

Mr. Lewis and his associates were sold on the idea of undertaking cooperative marketing effort with coal management. They knew, however, they would have to tread lightly at the start. Entering the marketing end of an industry was a revolutionary

### 3. By Creating New Dept. . . .

*IN APRIL, 1957, Mr. Lewis appointed Michael F. Widman Jr. (above), veteran UMWA executive, as Assistant to the President and head of the union's new Research and Marketing Dept. Mr. Widman is a skilled negotiator, long experienced in organizing and liaison work. Since creating the new office, UMWA has made giant strides in pioneering a new concept for labor-management relations. "We couldn't expect greater cooperation with industry leaders and coal companies," Mr. Widman stresses. "This wonderful relationship will immeasurably aid UMWA's research and marketing program."*

### 4. By Proposing "Common Voice" . . .

*MR. LEWIS, shaking hands with George M. Humphrey, chairman, National Steel Corp., moves to rostrum to make his now historic proposal for coal unity at the American Mining Congress Coal Convention, May, 1958. "I think," Mr. Lewis stated, "the industry needs a forum, which to some degree exists in other industries, where all segments of our industry could come to discuss, to debate and to conclude on matters of major public policy and acute problems that confront the industry." This proposal led to the development and formation of the National Coal Policy Conference in February, 1959.*

# Marketing Progress

concept for a labor union. Unobtrusively, astutely, therefore, and leading from the great strength of UMWA membership, which embraces 90% of bituminous and all of anthracite, they implemented the idea.

Implementation took shape in the several stages pictured above, which included the creation of a Research and Marketing Dept. whose aims, activities and accomplishments are highlighted in the following pages.

## Setting Up the Dept.

After discussing the idea for several years with other staff executives, John L. Lewis set up UMWA's Research and Marketing Dept. in April, 1957. Mr. Lewis chose Michael F. Widman Jr., veteran UMWA executive, to head up the new activity. A few months later, Mr. Widman selected Joseph P. Brennan, a Notre Dame graduate, as his assistant.

Basic purposes of establishing the department were to strengthen coal's competitive position in existing markets and to aid the industry in its search for new markets. "It was the feeling of our organization," Mr. Widman explains, "that while coal had been farsighted in production, it had failed to keep pace in the utilization of its product."

Mr. Widman adds: "The idea of a marketing department in a labor organization is, in itself, an innovation. The fact that the industry has allowed a union to engage in activities once considered to be exclusively management's domain is a tribute to the changed attitude of the former antagonists in coal.

"The formation of the Research and Marketing Dept. could only be possible after the two sides had reached a plateau of cordial labor relations. The industry has not had a major strike in 10 yr. During this period an understanding has been reached under which each side accepted its responsibility to promote the good of the industry and of the men who work with it.

"Within this framework was born the idea that together more could be accomplished than separately. We may still have our family fueds, but to the outside world there is no distinction between capital and labor in coal."

In a little over 3 yr the department has moved substantially and effectively into the industry's marketing operations by conducting special market promotion projects, by establishing closer liaison with other industry groups on matters affecting coal's competitive position, and by acting as a clearing house for new processes and methods for increasing coal consumption.

## Promoting Electric Heat

First activity—and the one for which the department is probably best known—was aimed at promoting electric heat and all-electric living. The big stake involved was crystal clear.

Growth in electric heat could be a major factor in boosting utility demands for coal to levels ranging upward from 465 million tons by 1975.

Growth in electric heat could also be the coal industry's best hope for recapturing big losses in retail sales during the past 15 yr, and for preventing further conversions to gas

and oil where cost advantages alone are not enough to sell direct use of coal with modern coal-burning equipment.

Mr. Widman was aware that some companies with substantial stakes in retail and commercial markets might take exception to promoting electric heat since it appears competitive with direct use of coal. But, he reasoned, any apparent conflict might be resolved with this approach to consumers:

"Certainly Pennsylvania anthracite is still a good buy for all home and heating purposes. And certainly bituminous is the cheapest fuel available for keeping people warm. But if you, as a consumer, want ultramodern, ultraconvenient and ultraclean heat, electricity is the answer. And here, coal stands ready to serve the Nation by producing the electricity to heat your home or other buildings."

In other words, where modern coal-burning equipment cannot be sold to customers or prospects, give them the alternative of coal converted to electric heat. Isn't this better than seeing them turn to gas or oil? Isn't this the answer to eventually regaining millions of customers lost to gas and oil during the last 15 yr?

In 1957, the Research & Marketing Dept. polled 136 coal-burning or prospective coal-burning utilities to find out what the coal industry could do to stimulate public and consumer interest in electric heat. Nearly all utilities responded, underscoring one central fact: They would welcome coal's entrance into the promotion of electric heat and all-electric living.

Implementing this favorable response, Mr. Widman and his staff initiated a series of 16 articles on modern uses of coal and electricity. For the past 2½ yr (since February, 1958) the articles have been published in the *United Mine Workers Journal*, the union's official publication. The *Journal*, with some 300,000 readers, circulates automatically to the entire UMWA membership and, on request, to other interested parties including, for example, officials with coal-producing companies, industry associations, government agencies and allied industries.

UMWA's series of articles are believed the first emanating from coal quarters to publicly record the coal industry's stake in electric heating and all-electric living. And, although it is always difficult to measure the impact of editorial material, the following facts are worth noting:

1. Numerous electric utilities have reprinted the articles for circulation to their sales staffs, to equipment manufacturers, and to electric-heating customers and prospects.

2. The articles have generated widespread discussion among executives in the coal, electric-utility and allied industries.

3. During the 2½-yr period covering publication of the articles, electric heat has come of age and new growth patterns have emerged for coal (*Coal Age*, January, 1959, p 70). Power plants, for example, consumed an estimated 6.8 million tons of coal to heat some 621,000 residential, commercial and industrial buildings in 1959. This year, *Electrical World*, a McGraw-Hill publication, predicts that coal burn for electric heating could rise to 8 million tons.

On these three counts alone, it is not unreasonable to conclude UMWA's promotion of electric heat has been a vital factor in developing a market of great mutual interest to the coal and electric-utility industries, and thus in building strength for coal in its largest-tonnage market.

## Cutting Utility Use Costs

Two new market promotion projects are on the agenda, Mr. Widman reports. One, in the planning stage, is a series of articles on existing and potential chemical uses of coal, to be published in the *United Mine Workers Journal*. Another, already underway, is a study of ways and means to lower incremental costs incurred by utilities in handling and stockpiling huge quantities of coal for use during emergency periods.

Mr. Widman figures the germ seed for such a study might have been planted at NCA's annual convention in June, 1956, when John W. Evers, president, Commonwealth Edison Co., made the following statements:

"A guarantee of steady coal supplies could lift a heavy financial burden from the shoulders of power companies. For example, Commonwealth Edison today has 3,600,000 tons of coal in storage at its 12 generating stations. We maintain this reserve for one purpose only—emergencies. We are burning about 30,000 tons of coal a day. This tremendous inventory costs us $20 million. Carrying charges on this inventory are substantial, not to mention such extra cost as compacting the storage piles and double handling.

"Nothing would suit us better than to be able to reduce our coal reserves. But we must always think first of the continuity of electric service to our customers. We will not soon forget the difficulties of the late 40's when our customers were forced to curtail their power use to stretch our dwindling coal reserves.

"There is increasing evidence that both the coal operators and the miners appreciate the need for continuity of production. I do not believe that such a millennium is beyond achievement."

Commonwealth Edison's experience is by no means isolated. Electric utilities, virtually across-the-board, have similar incremental-cost problems. And the UMWA cites the following reasons why coal should be concerned:

1. Present methods of computing costs on a Btu basis are outmoded and do not entirely represent the true costs of consuming coal.

2. The availability of natural gas and oil in coal areas poses a most serious challenge for coal competitively.

3. Utilities are becoming more cost conscious and are beginning to study not only the price of fuel, but also costs associated with the transportation, handling, etc., of the fuel.

4. Incremental costs may have grown to serious proportions and may greatly magnify coal prices, thus being injurious to coal's competitive position.

5. Many of the coal-storage and handling techniques are not justified by economics, but by psychological motives associated with an earlier era entirely apart from the cordial relations existing between labor and management in the coal industry today.

6. A study of incremental costs and a determined effort to eliminate them once they are delineated would further solidify coal's position as the Nation's dominant energy source.

By May of this year, Mr. Widman had made some 25 presentations to engineers and executives with coal-producing companies and electric utilities, including TVA. A new round of consultations is scheduled for current summer months.

In making these presentations, Mr. Widman recommends several basic steps to determine the possibilities of lower incremental costs. These include:

1. The cost-accounting sections of an interested consumer company should engage in a study to evaluate all costs, direct and indirect, connected with large-scale consumption of coal.

2. Careful consideration should be given to methods which will drastically cut these expenses.

3. Coal handling should be automated as much as coal production has been mechanized to bring costs to an irreducible minimum.

4. Coal stockpiling, one of the major coal-cost components, should be done near or at the site of production, rather than at the point of consumption.

Both electric utilities and coal-producing companies have responded to UMWA's proposal with much interest. In coal quarters some concern has been expressed about temporary reductions in utility-held inventories which would result initially. But, as the union sees the picture, where there are real potentials for saving electric utilities 3 to 4c per million Btu, temporary losses would be far outweighed by long-range benefits which would accrue to coal by helping its biggest customers reduce costs. If a power plant, for example, could save 3c per million Btu on an annual coal-burn of 1,000,000 tons (averaging 26.2 million Btu-content per ton), it could cut annual fuel costs by $786,000.

## Building Coal's Competitive Strength

The Research and Marketing Dept. is the focal point of UMWA's liaison with other industry groups working to strengthen and improve coal's competitive position. In this capacity, the department cooperates closely, for example, with various divisions of the National Coal Association and with the National Coal Policy Conference. Mr. Widman and UMWA President Thomas Kennedy are, in fact, NCPC directors; Mr. Lewis, president emeritus, UMWA, is vice chairman and a director.

In recent months, liaison activities have brought UMWA's Research and Marketing Dept. into the midst of industry campaigns, including those seeking a national fuels policy, fairer treatment for coal on "dump" natural gas and residual oil imports, a new coal-research program, and federal aid in alleviating the effects of unemployment in depressed mining areas.

The department has taken particular interest in working with NCA divisions functioning to prevent conversions to competitive fuels and to develop new tonnage for coal among government and large industrial consumers.

"We are moving toward sound practice in fighting coal's competition more effectively," Mr. Widman notes. "An aggressive, united front is building new strength for coal before Congress, other federal agencies, state and local governments. It is especially encouraging to see more individual companies getting into the battle. Whatever gains there have been so far, however, must be multiplied many times before we can achieve the industry-wide competitive strength needed to realize the rich promise of coal's future.

## Evaluating Research Ideas

As a clearing-house for research ideas, the Research and Marketing Dept. is constantly exploring new methods and processes for increasing coal consumption. During the past 2 yr numerous ideas have been studied including, for example, a proposal to set up a string of charcoal-processing plants across West Virginia, suggestions on how to eliminate the abrasion of metal parts in the coal-fired gas turbine, prospects for the coal-based road-paving material now under joint development by Curtiss Wright and Peabody Coal Co., and potentials for a coal-fired diesel engine.

The UMWA feels that a great future exists in the discovery of new ways to utilize coal. Greater joint interest by all segments of the coal industry, however, is necessary to bring potentials to reality. Efforts in this direction could be extremely fruitful in terms of new markets and increased production.

In spite of the many research ideas and project-proposals which have come up, UMWA observes the coal industry has generally resisted, or remained indifferent to, a full-scale research and development program. In part this attitude could be due to the fact that some companies have felt they were "burned" in the past by investing in ill-conceived or ill-administered projects which have not paid off. In part it could also be due to difficulties in selling research benefits to an industry composed of many companies operating in different seams from which are produced coals of widely differing qualities and characteristics.

"Although justifications for lack of research can be made," Mr. Widman states, "these do not obviate the need for reversal of customary attitudes, and for increasing expenditures on both basic and applied research. We do not want coal to take a back seat in the American economy. And this eventuality could occur if coal continues to spend less on research than any other major industry."

## The Promise of the Future

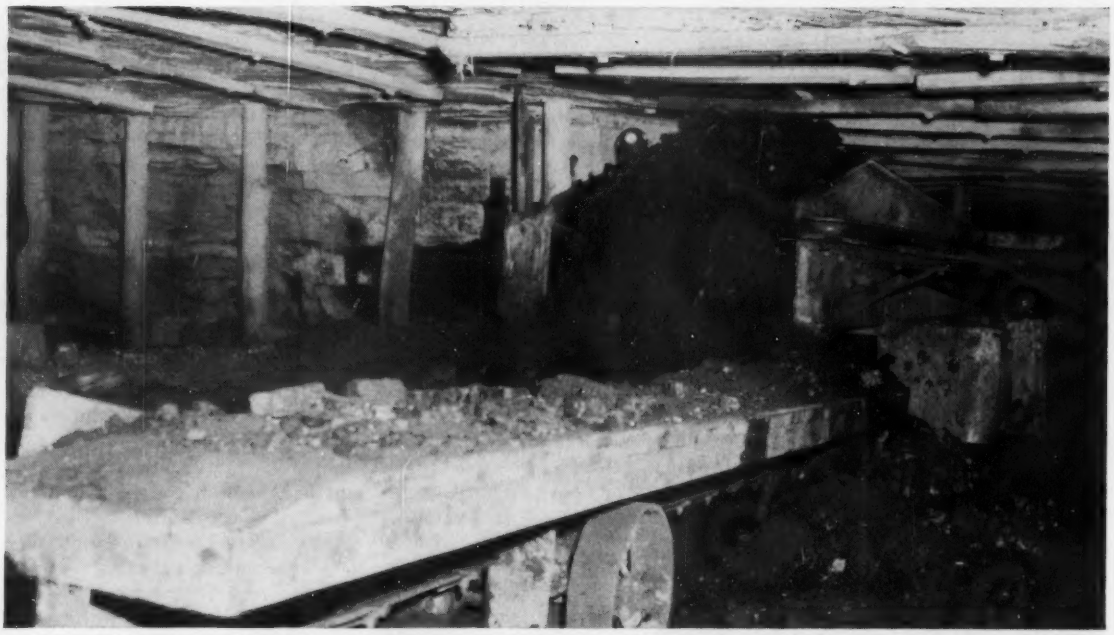
The UMWA has written the opening chapters of the story of its entrance into coal's marketing arena. Certainly these chapters have been brilliantly successful ones. They can be so declared on the basis of:

1. The UMWA's imaginative approach to coal's marketing problems, highlighted in the preceding paragraphs.

2. Coal management's enthusiastic response to UMWA activities in a field previously considered out of its domain.

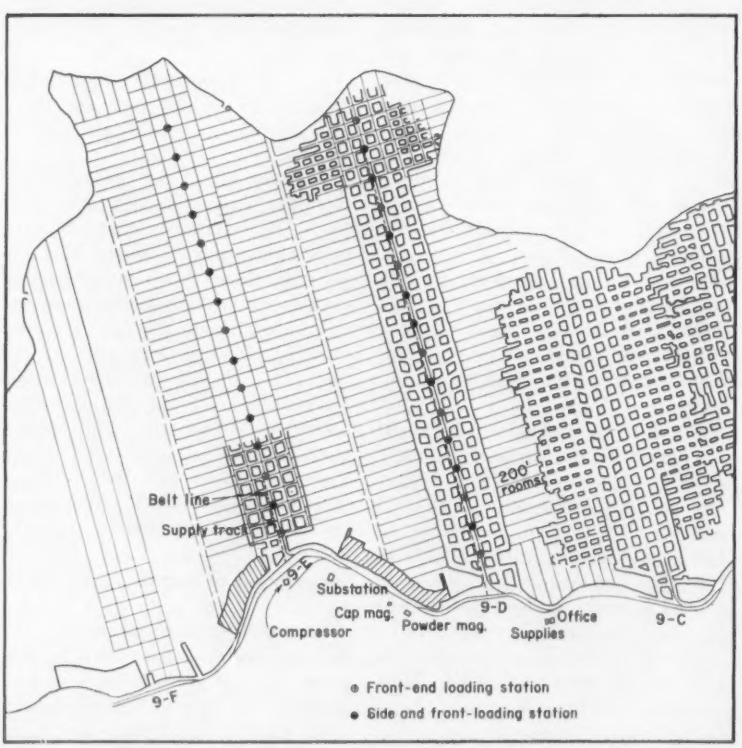
As successful as the opening chapters have been, those still to be written could be more significant. Coal management has a powerful new ally with which to work in eliminating deficiencies in its marketing program, recognized during the past 2 yr, for example, through formation of the National Coal Policy Conference and reorganization of the National Coal Association. The new ally's power stems from an industry-wide strength and unity of purpose which transcend the rugged individualism which has generally characterized company marketing practice and retarded achievement of industry sales potentials.

This new strength undergirds the promise that the industry will be able to match vast postwar gains in productivity and labor welfare with equivalent gains in marketing, and move realistically toward fulfilling its rightful place in the American economy.

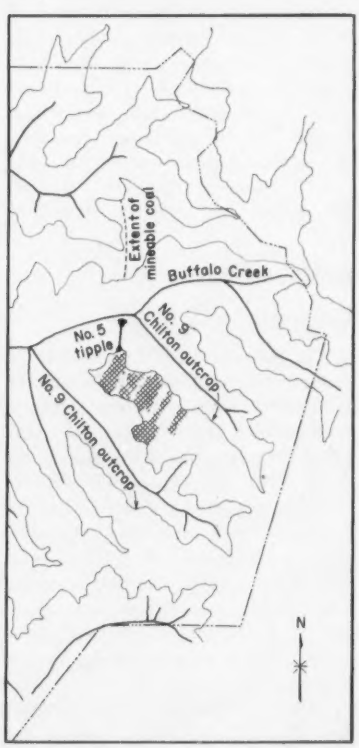


**COAL FROM SHUTTLE CARS** is transferred to belt conveyor as a part of the punch-mining setup at the Lorado property. End- and side-loading stations are used, depending on the circumstances at the time the station point is reached.

# Punch Mining . . . How It Works for

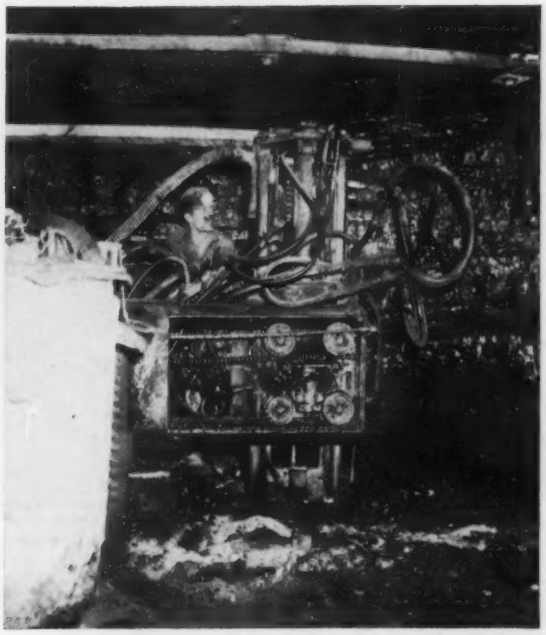



**PUNCH MINES** are opened at intervals of 660 ft. Main headings are driven through the mountain. Rooms are driven to the right and left of the mains on retreat.




**PROPERTY MAP** shows Mine No. 9 and the outcrop of the Upper Chilton seam.

**END-LOADING STATION** for shuttle cars permits unloading at fast speed without excessive spillage.



**ROOF BOLTS SET ON 4-FT CENTERS** are installed through cross bars. Two men perform this operation in the mining cycle.

# Lorado Coal

A FAST-MOVING MOBILE PUNCH-MINING SYSTEM makes it economically attractive for The Lorado Coal Co., Lorado, W. Va., to recover coal from a seam that previously had been augered. Ingenuity in planning and the use of mobile facilities are the basic success steps in operation at the company's No. 9 mine.

Initial plans called for augering the Upper Chilton seam before the punch-mining operation was set in motion. Augering the property first provided a bench for follow-up punch mining and at the same time furnished ample production during the construction period. Very little preparation was required when punch mining began.

Mobile facilities include belt-conveyor loading stations and sled-mounted substations, office and supply house. These facilities can be easily moved from one setup to another.

## The Company: Property and Policy

Punch mining is in the 68-in Upper Chilton seam approximately 600 ft above drainage. The seam has two partings. One is a 5-in rock parting and the other consists of 6 in of bone. Estimated mineable coal remaining in this seam alone is better than 3½ million tons. The system herein described will be employed to recover coal from the seam which lies near the top of the mountain.

The company also is deep mining another seam on the property with conventional mining equipment and by conventional methods. Still another seam is in the development stage and will go into full production at a later date.

Lorado Coal has been mining coal in this area—the heart of the bituminous coal region—for the past 44 yr. Although it is not one of the "giants" of the industry it is a progressive company which recognizes that the small- and medium-sized companies must think and act as the giants do to remain economically healthy.

Industrial engineering, plus good management, has made it possible for the company to economically operate potentially high-cost mines. It has successfully practiced industrial engineering for more than 8 yr (*Coal Age*, October, 1958, p 86). The type of thinking exercised by top management can best be illustrated by repeating a statement made by John W. Stratton, general manager. "An aggressive management which makes full use of an industrial-engineering staff to investigate problems, gather facts and analyze opinions can make a greater number of informed and defensible decisions than can the same management relying only on its own investigations. Such investigations by management must be fewer in number or less comprehensive in scope because of the limited number of hours any one individual can work in a given day."

## The Equipment: Machines and Facilities

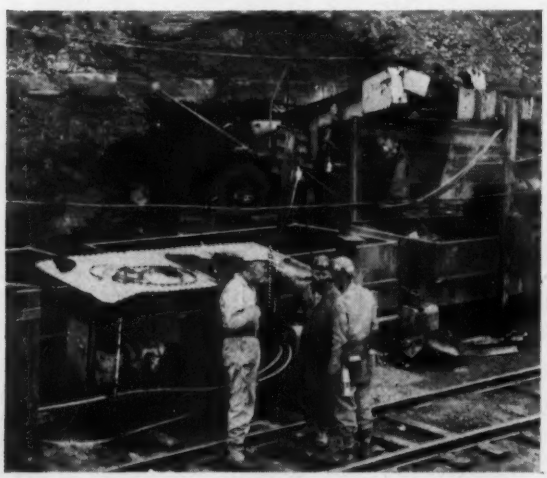
Punch mining is carried out with three complete sections of mining equipment, plus a small crew that develops openings along the outcrop for the regular production sections. The three production sections

**PORTABLE OFFICE AND SUPPLY HOUSE** were converted from truck bodies. They are mounted on skids for easy moving.

**CUTTING MACHINE** double cuts each place. The cutter is equipped with bugduster and 11-ft bar.

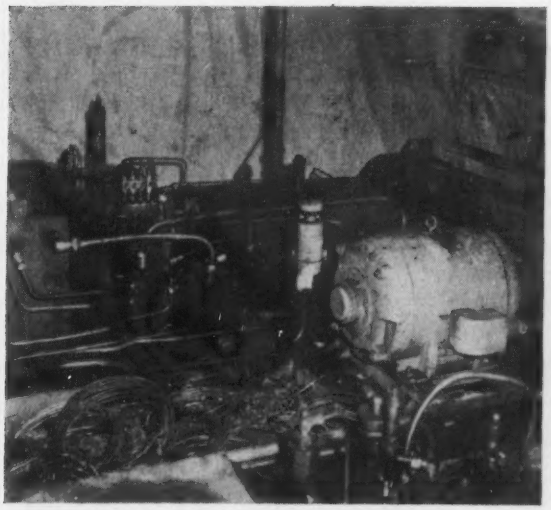
**CONVENTIONAL LOADER** cleans up places in approximately 24 min. Each cut contains about 30 tons of clean coal.

**SHUTTLE CARS** equipped with four-wheel drive and boom lift travel at 6 mph with a payload of approximately 5 tons.

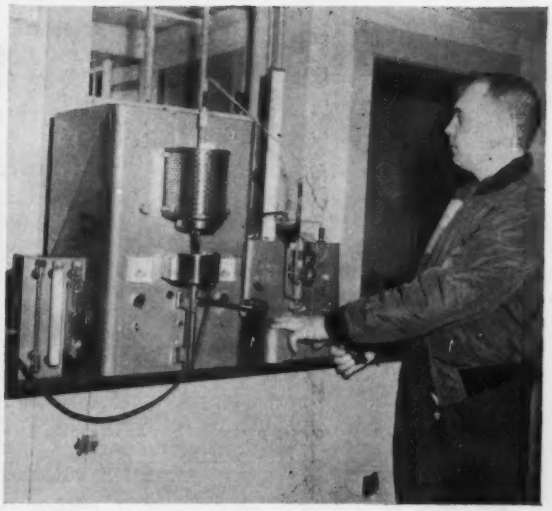


**BELT CONVEYOR** discharges into mine cars located outside. The loading station is on a side track.

**ROTARY DUMP** is completely automatic. Motorman sets loads on dump and presses a button to start the unloading cycle.



**COMPRESSORS** are installed outside and air is piped to the sections for breaking the coal.



**MODERN LABORATORY FACILITIES** monitor quality. Dudley Walls, preparation superintendent, is making a sulfur test.

account for all the tonnage from Mine No. 9. They are equipped with conventional mining units, mainline belt conveyors and mobile service facilities, such as, substations, compressor stations for Airdox breaking, office and supply house. One section contains new Jeffrey equipment and the others Joy. The section lineup is as follows:

**Jeffrey Unit**—81AH loader with a loading capacity of 14 tpm and a tram speed of 7 mph.

70URB cutter with bugduster and 11-ft bar.

Two 66B shuttle cars with four-wheel drive, boom lift, 5-ton capacity and a speed of 6 mph.

Fletcher roof bolting machine.

Long ropeframe belt conveyor.

**Joy Units (two)**—14 BU 7BE loader.

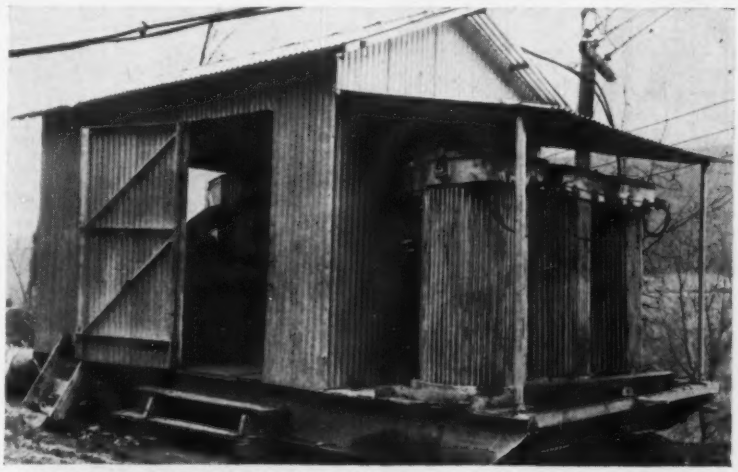
29UC Jeffrey cutter with bugduster and 9½-ft bar.

Two 42E16 shuttle cars.

Fletcher roof-bolting machine.

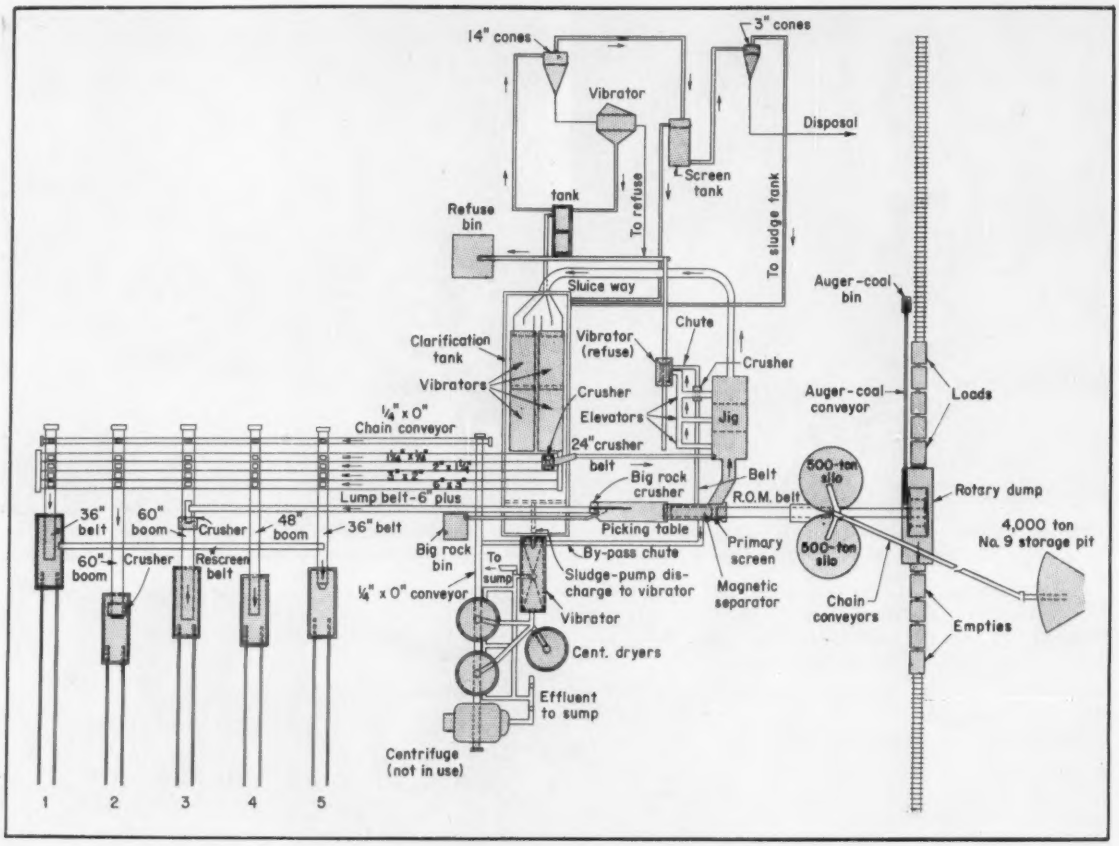
Long ropeframe belt conveyor (two units feed to same belt).

Shuttle cars discharge directly onto Long Lo-Rope conveyors which feed into mine cars at "high top" (outside). The belt-loading station is served by a sidetrack. Empties and loads are handled by a 10-ton locomotive. Loads are taken to a rotary dump on the



**PORTABLE SUBSTATIONS** including transformer, switchgear and rotary converter, are mounted on skids so that power can be kept close to the mines.

**COAL IS STORED** in an open area below the dump. It is fed onto a chain conveyor by an underground feeder.




FLOW SHEET of the No. 5 preparation plant.

same level as the mine. Cars are placed on the dump by the motorman who then pushes a button to put the complete dumping cycle on automatic control.

Coal discharges into a 4,000-ton open-storage area below the dump. This coal is then moved onto a 500-D15 Long chain conveyor by a feeder under the storage area. The conveyor discharges to an identical chain conveyor which carries the coal down the mountain and into the preparation plant.

Substations, compressor stations, belt-conveyor loading stations and office and supply house are designed so that moves can be made quickly and efficiently. Substations, office and supply house are mounted on sled-like runners. Loading stations and compressor stations, although not mounted on skids, can be relocated with ease when necessary.

The office and supply house were converted from old moving-van truck bodies.

A bulldozer is used to transfer units from one location to another.

The belt conveyors are located in the middle opening of the main headings. A supply track is installed along the belt and is used to supply the sections on the third shift.

Belt-loading stations on the section are installed for end-on loading and for side and end loading. Loading stations are indicated by circles on the accompanying mine map. Plain circles are for end loading only and black circles are for end and side loading.

## The Method: Mining Plan And Performance

The seam is divided into areas 660 ft wide along the outcrop. Depth of each mine is determined by the distance through the mountain and will vary from 1,000 to 2,000 ft, averaging 1,600 ft. Openings are 660 ft apart so that rooms can be driven 200 ft to the right and left of the headings.

Entries are advanced by driving five headings on 60-ft centers. The belt and supply-track heading is 25 ft wide. Other main headings are 20 ft wide. Rooms are driven 25 ft wide. The mains are driven to the outcrop on the opposite side of the mountain. The retreat plan is based on alternating room-and-pillar work on the right and left side of the main headings or working a unit on each side simultaneously, using the same dumping point.

The map of the two mines is shown in the accompanying illustration. Main headings in the No. 9D mine have been completed and rooms are being driven on both sides of the mains. The production unit will continue mining to the right and left of the mains until it reaches the outside. Mine No. 9C (to the right of 9D) has been mined out. When No. 9D is completed the section will move to 9F which is being developed by the small work crew.

While one mine is on retreat the other is driving main headings. Sections are kept in proper advance and retreat stages to minimize roof trouble.

Eight men plus the foreman comprise the Jeffrey and Joy section crews, as follows:

Loading-machine operator.

Cutting-machine operator and helper.

Two shuttle-car operators.

Shotfirer.

Roof-bolting-machine operator and helper.

With a well-balanced work cycle, the machine crew averages 14 cuts per shift. On a performance basis the industrial engineering department has established that at 80% efficiency the machine should cut 13.2 places per shift and at 100% 16.5 places per shift. It takes 7 to 8 min to cut a place. Places are double cut. After the machine sumps in and starts cutting across the face Airdox holes are drilled by the machine helper and roof-bolting helper. Ten holes are drilled in each place. Four are placed in the top, three over the rock parting and three under the parting. Holes are completed about the same time the cutter is ready to move to the next place. While the machine is moving, the shotfirer loads the holes with Airdox tubes which are charged to 9,400 psi.

Each cut contains approximately 30 tons of clean coal. Time required to clean up cuts is approximately 24 min. At 80% efficiency a section will load 486 tons of clean coal and at 100%, 607 tons.

Top conditions are good. Roof support is provided by 36-in bolts (60-in when top is bad) set on 5-ft centers. Bolts are installed through holes drilled in 2x6x14-in cross bars. Posts are set on 5-ft centers on the right and left of headings. Thirty-five minutes are required to bolt and timber each place.

All equipment maintenance and general mine maintenance is done by a six-man crew on the third shift. Two troubleshooters on the day and evening shifts handle emergency breakdowns and make minor repairs.

## Supervisory Personnel, The Lorado Coal Mining Co., Div. of The Lorain Coal & Dock Co.

**John W. Straton**, General Manager

**Clinton W. Thompson**, General Superintendent

**Roston Toler**, General Mine Foreman

**J. E. Green**, Foreman (night)

**Kenneth Milton**, Foreman (3rd shift)

**Creed Vance**, Chief Electrician

**Robert Dice**, Maintenance Superintendent

**Dudley Walls**, Preparation Superintendent

**Woodrow Hinchman**, Preparation Foreman

**Elmer Rorrer**, Preparation Foreman (night)

**Carl Hawkins**, Maintenance Foreman (3rd shift)

### Section Formen, No. 9 Mine

| | |
|---|---|
| **James Moore** | **Ray Lovejoy** |
| **Dennis Perry** | **Nathan Bailey** |
| **Charles E. Brown** | **Darrel Bailey** |

## The Preparation Plant: Facilities and Quality Control

Raw coal from the open-storage area is conveyed down the mountain and stored in two 500-ton silos. It then is fed onto a 48-in. R-O-M belt conveyor which discharges onto a primary screen. Plus 6-in passes over a picking table before being loaded into railroad cars. It also can be crushed to any size.

Minus 6-in goes to a three-cell Jeffrey jig. Refuse is elevated and conveyed to a 5x10 Low Head dewatering vibrator and then conveyed to a refuse bin for disposal.

Clean coal is sluiced to two Low Head vibrators which in turn discharge onto two Ripl-Flo vibrators. All four classifying and dewatering screens are located above a large sludge or clarification tank. Underflow, which includes all the ¼x0 from screens, is collected in this tank.

Products consisting of 1¼x¼, 2x1¼, 3x2 and 6x3 from the classifying screens are collected on conveyors for loading into railroad cars.

The ¼x0 product from the clarification tank is pumped onto a 6x16 vibrator. Underflow goes to a sump. Top product (¼x0) is distributed to three CMI centrifugal dryers. Effluent is pumped to the sump. Dried ¼x0 is conveyed by belt to a chain conveyor for loading into railroad cars.

Effluent from the sludge tank flows to a Rayburn tank and pumped to H&P 14-in cyclones. Overflow goes to another tank equipped with a screen. Top product is returned to the clarification tank and bottom product is pumped to H&P 3-in cyclones. Overflow from these cyclones is returned to the sludge tank and underflow goes to the disposal area.

Underflow from the 14-in cyclones discharges onto a 4x10 Low Head vibrator. Top product goes by conveyor to the refuse bin for disposal. Bottom product is returned to the Rayburn tank.

**Quality Control**—Lorado Coal maintains a well-equipped laboratory to monitor the quality of coal prepared at the plant and also to analyze the quality of the coal being mined on each section. Channel samples are collected bi-monthly from the center heading of each section. Moisture, ash, sulfur and gravity tests are performed on each sample.

Every car of prepared coal under 2 in or combination of 2 in is sampled.

Reports are sent to the sales department so that a permanent record can be maintained. If a customer desires to know the quality of coal in any car the sales department will furnish him a report of the analysis.

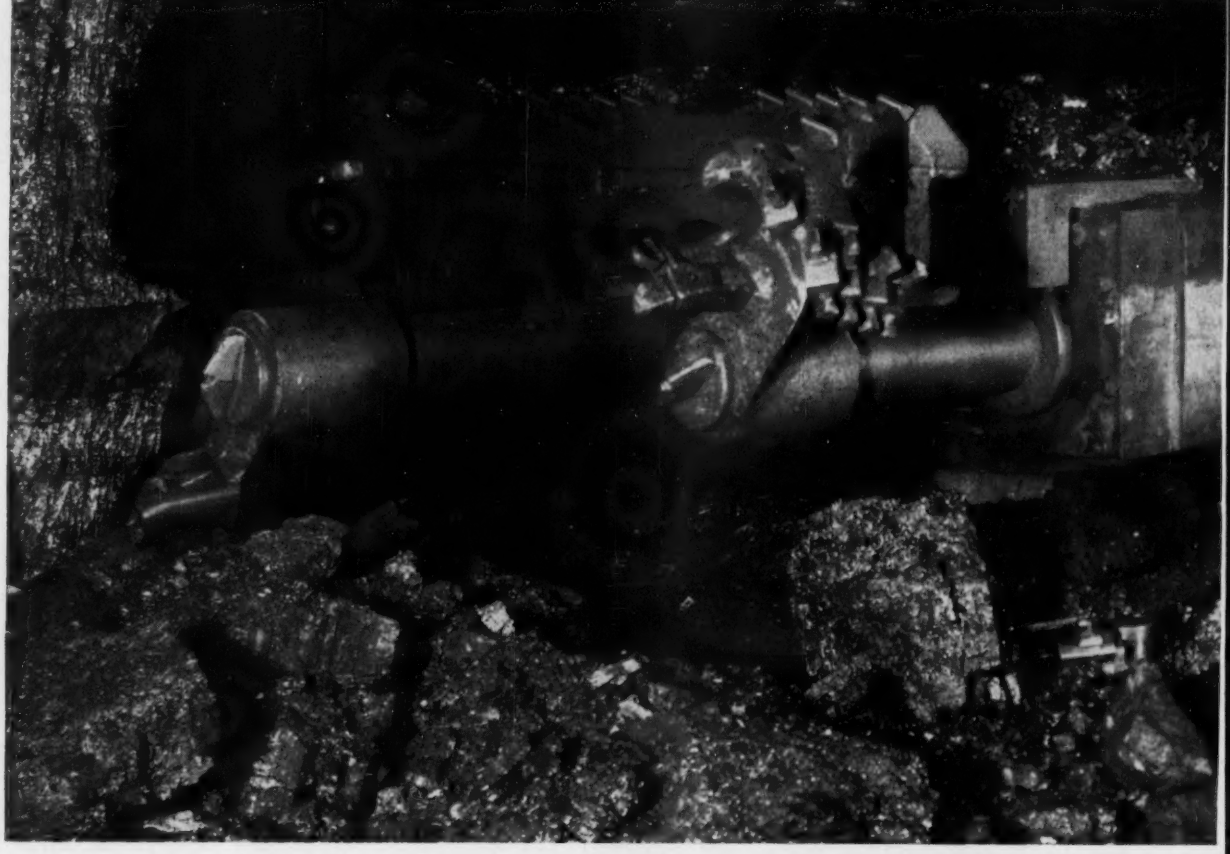
Screen tests are made weekly.

The lab is supervised by Dudley Walls, preparation superintendent. Two lab men are needed to make the necessary tests. The actual number of tests made for sulfur, moisture and ash for the following months is typical of the work at Lorado to maintain and produce quality products.

| | Sulfur | Moisture | Ash |
|---|---|---|---|
| October | 459 | 847 | 867 |
| November | 213 | 581 | 721 |
| December | 100 | 631 | 692 |

The peak number of sulfur tests conducted in any one month was 469. A Leco 521A induction furnace is used to determine the ash and sulfur contents.

# HIGH PERFORMANCE



## 200% more tonnage per man as JEFFREY 86-A Colmol works in 36" seam

Production of 860 tons of raw coal per shift has been attained, with consistent performance, giving better than 90 tons per face man over a three-month period.

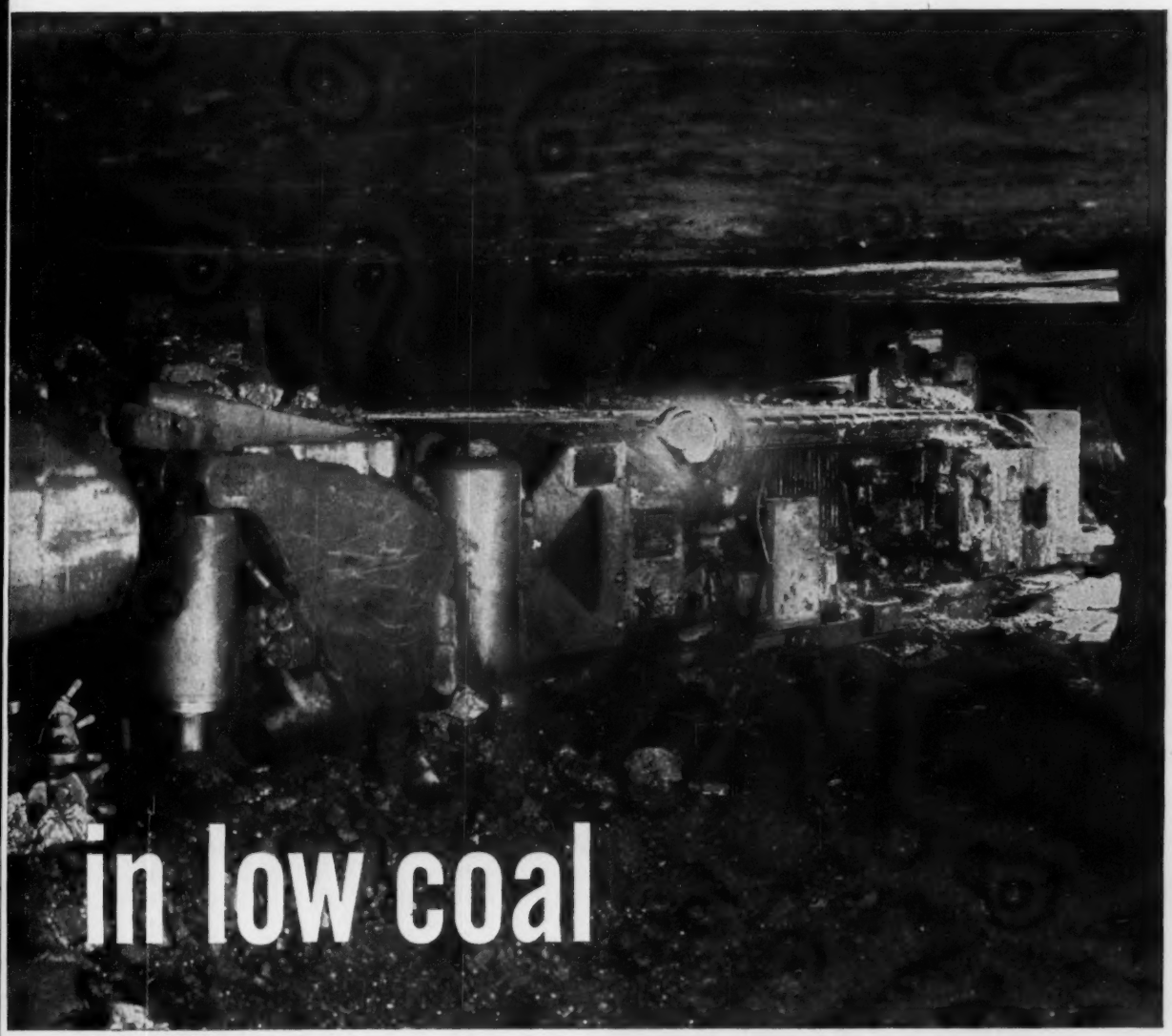
The 86-A is only 25¼ inches high, makes a cut 14' 7" wide, is ideal for low seams 28" to 44" in height. All adjustments are hydraulic, and can be made quickly and accurately. Easy maneuvering contributes to the Colmol's high performance.

To move your costs down—productivity up—get Jeffrey's *system engineering* recommendations . . . covering equipment for mining and hauling or conveying. A system engineered job pays off in predictable results!

The Jeffrey Manufacturing Company, 912 North Fourth Street, Columbus 16, Ohio.

### CONSISTENT PERFORMANCE WITH COLMOL IN THREE-MONTH PERIOD

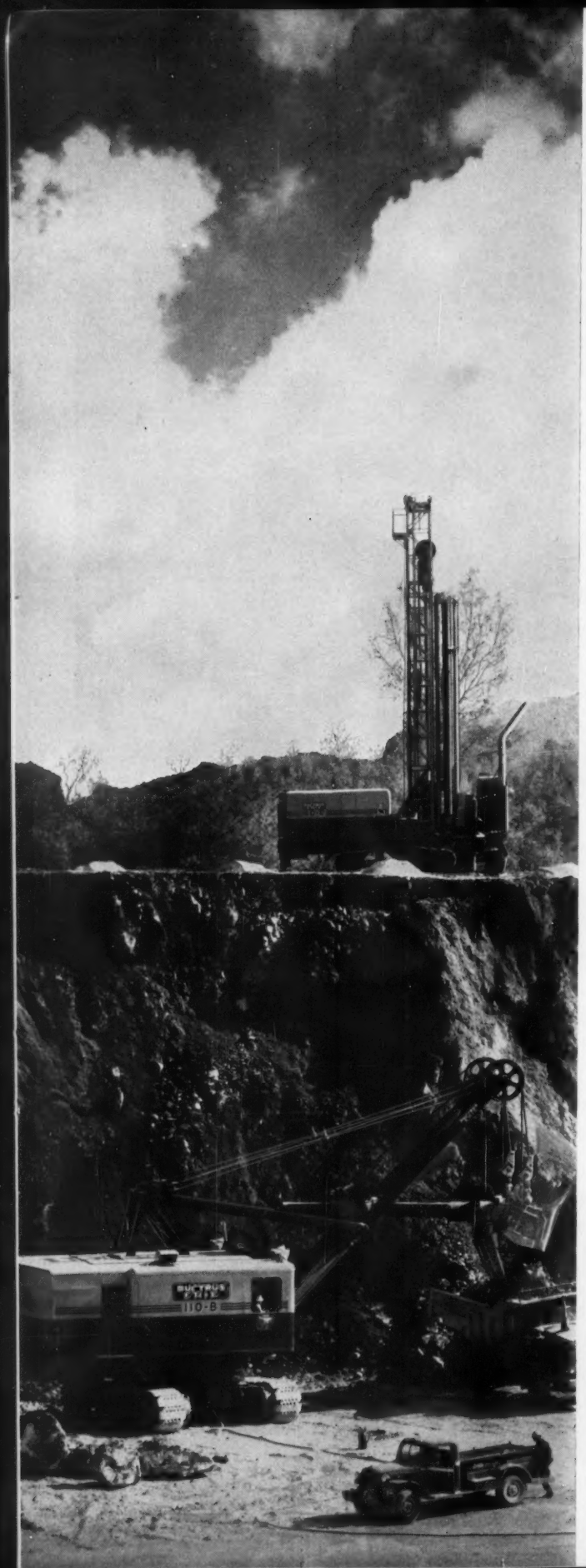
| No. Shifts | Tonnage | Tons/shift | Tons/man |
|---|---|---|---|
| 79 | 43,450 | 550 | 91.3 |



**OFFICES:** Birmingham, Alabama; Bluefield, West Virginia; Denver, Colorado; Evansville, Indiana; Harlan, Kentucky; Iron Mountain, Michigan; Pittsburgh, Pennsylvania.

JEFFREY

MINING • CONVEYING • PROCESSING
EQUIPMENT...TRANSMISSION MACHINERY...
CONTRACT MANUFACTURING




*A message from*

**ROBERT G. ALLEN,**
**President,**
**Bucyrus-Erie Company**

# *the president of Bucyrus-Erie:*

## "Here's why you buy a whole system of profitable operation when you buy a Bucyrus-Erie!"

"**Bucyrus-Erie** builds 182 completely different models in the ⅜ to 20-cu-yd class.

**Bucyrus-Erie** builds cranes and excavators utilizing manual, hydraulic, air and electric controls . . . gas, diesel or electric-powered.

**Bucyrus-Erie** builds a complete line of draglines from ⅜ to 45 cu yd, many of which can be offered with crawlers or as walkers.

**Bucyrus-Erie** builds a complete line of stripping shovels from 2½ to 150 cu yd.

**Bucyrus-Erie** builds a full line of special machines **in addition** to the standard models, including wheel excavators, tower cranes and railroad wrecking cranes.

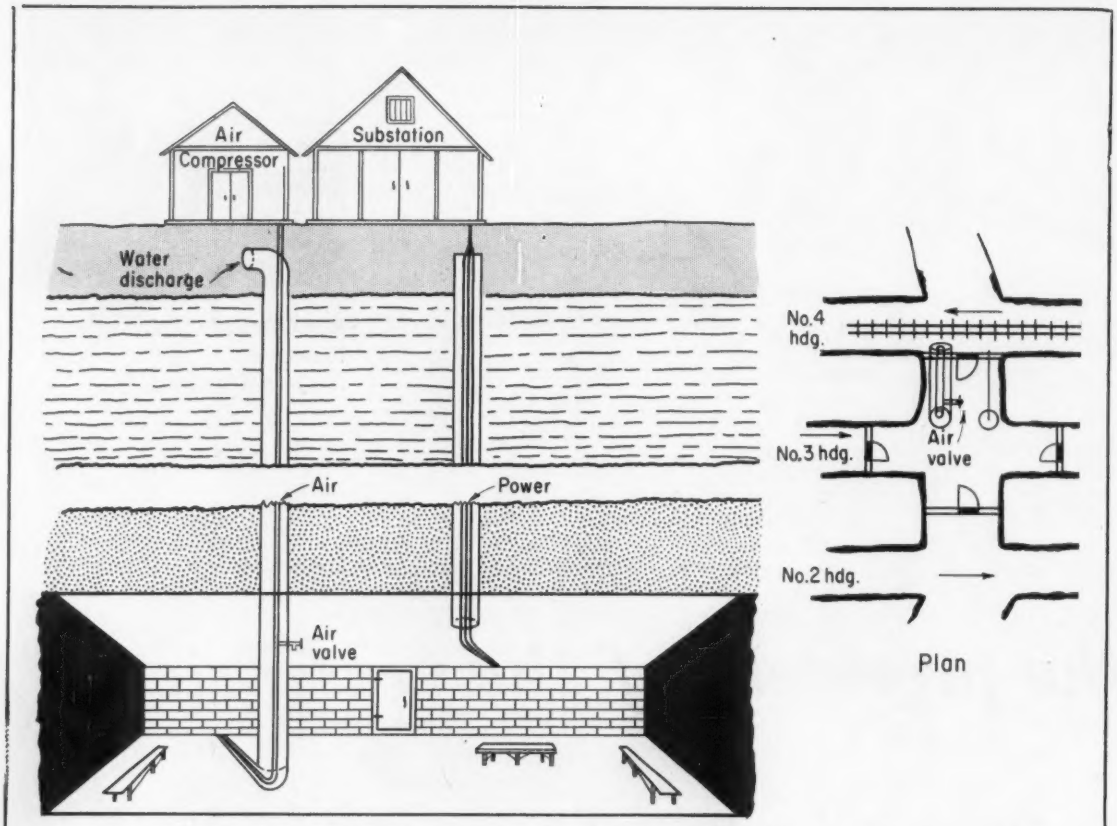
**Bucyrus-Erie** builds 25 different blast hole, water, and oil well drills of every type—churn, rotary, down-the-hole, jet-piercing and diamond bit.

**Isn't it logical that this is the kind of depth-experience that can best provide you with assistance in building better profits from your operation?"**

9L60

Robert G. Allen

BUCYRUS-ERIE




**WHEELER BARRICADE,** first one built at Eastern Coal's Mine No. 4, provides a pressurized chamber with communication to surface through boreholes.

# Permanent Barricades Provide Emergency Havens

Vacant substations are converted into underground refuges in Eastern Coal Corp.'s safety effort.

By **Vance Price,** General Superintendent, Eastern Coal Corp., Stone, Ky.

RECENT disastrous mine fires have caused operating personnel at many mines to stop, check, and evaluate their own particular situation in regard to fire-fighting methods and equipment. Much emphasis has also been placed on the instruction of all personnel in the knowledge and maintenance of established escapeways from all sections of the mine, and the advisability and methods of erecting suitable barricades in event of an emergency.

Eastern Coal Corp. officials at Stone, Ky., stopped and checked, and when they evaluated their own particular situation they were not satisfied with the results. The evaluation disclosed that Eastern Coal (much the same as many older companies) had old and extensive workings, mining having been in progress since near the turn of the century. Many of these second escapeways, however, are difficult to travel due

to water, low heights, and, in many places, the necessity to skirt around and over slate falls. In addition, crews on some sections would have to travel as much as 20,000 ft from the working faces to the outside.

W. E. Wheeler, assistant general manager and safety director, was concerned with these long distances which the men would have to travel and the fact that many of the crew members are older men who spend their entire shift in the faces and are not accustomed to, or physically able, to withstand such long walks under the pressure of an acute emergency. Faced with these facts, Mr. Wheeler conceived the idea of erecting permanent barricades underground at locations which are accessible to the working sections. The logical place to build these barricades appeared to be at the various substation locations where holes have already been drilled from the surface to the coal seam.

## Barricade Design

The first permanent barricade was installed during March, 1960, along the main haulage road in No. 4 mine. This barricade is centrally located for the four sections in that general area and is constructed with enough area included to accommodate all workmen in that area. The barricade is located in the center of a five entry system which has intake air in Nos. 4 and 5 entries and return air in Nos. 1, 2 and 3 entries. At this location two separate 6-in diameter holes had been drilled from the surface of No. 3 entry. One hole is used for DC power transmission lines from the rotary converter set in the surface substation. The second hole has a 2-in pipe inside a 6-in pipe. Compressed air from a surface-located 285-cfm compressor is pumped through the 2-in line to the right side of the mine where percussion air tools are used for roof bolting. Mine drainage water is pumped up through the hole in the area between the 6-in and 2-in pipes.

When the power and pumping facilities were installed, permanent cinder block stoppings were built across No. 3 entry, inby and outby the drill holes, and in the cross cuts between No. 2 and No. 3 entries. The only thing necessary to complete the barricade was the construction of another stopping between No. 3 and No. 4 entries and the installation of small hand doors in the stoppings so that the barricade can be entered from either the intake or return side. The enclosed area of the barricade is approximately 1,700 sq ft. This area has been closely timbered and roof bolted, and rock dusted heavily. Incomplete grouting and caulking of the power bore hole left a constant dripping of water from the bottom of the hole which is fed year around by a sub-surface stream. This would provide ample water for any number of men for as long as is needed.

At the bottom of the hole containing the compressed air line, a system of valves has been installed so that in an emergency the air can be cut off from the working sections and diverted inside the barricade area, thereby setting up a positive pressure inside the barricade which would prevent any explosion or mine-fire smoke and gases from entering the barricade. Oral communication from the barricade to the surface is possible through the power bore hole.

In an emergency the power cables could be quickly removed so that food and medicine could be lowered down the hole. As stated before, this barricade is centrally located and of sufficient area to barricade all the men from the four working sections in that area for any period of time that would seem necessary after a mine fire or explosion. The chances of all men being able to reach the barricade is greatly enhanced by the fact that a majority of the men have secured their personal self-rescuer apparatus which they carry with them at all times.

A second barricade has been constructed near the main haulage road in a seven entry system on the left side of No. 4 Mine and another will be constructed near the main haulage road in a seven entry system on the right side of the mine as soon as the power drill hole, which is now being drilled, has been completed. Each of these barricades will be relatively close to two working sections for the remainder of the life of the mine.

The second barricade will differ from the first in the respect that only one drill hole from the surface will be incorporated within the barricade. This one hole carries the power cables from the surface substation to the mine so that the compressed air and water which is available in the first barricade will not be available in the second. Tests have been made which show that when the mine ventilation is normal the velocity of fresh air down the hole is 1,142 fpm, which with the area available produces 228 cfm of intake air. A small portable type fan has been installed in the substation building and connected directly to the drill hole casing. With this booster fan in operation the intake down the drill hole is increased to 576 cfm.

## The Advantages

The greatest single advantage of the barricades has been the psychological effect on all men who work in No. 4 mine. The fear of fires and explosions, while not often openly discussed, is ever present in the minds of all who enter the mine. The knowledge that the barricades have been and are being built, and will afford a place for safety during or after a disaster, has done much to relax this tension. One workman was heard to remark, "It's like insurance; you hope like hell that you will never need it but it's nice to know it's there in case you do."

The presence of the barricades has induced a majority of the workmen to secure self-rescuers since it has been explained that the rescuers will afford them protection against smoke during the time required to travel from the working faces to the barricades.

The actual cost of the barricades has been small since existing facilities have been used and regular ventilation men who are already on the job are doing the construction as time permits.

Eastern Coal Corp. maintains its general office in Bluefield, W. Va., where its president, Laurence E. Tierney, resides. The mines are located at Stone, Pike County, in eastern Kentucky, near Williamson, W. Va., and Pikeville, Ky. During 1959 Eastern Coal produced a total of 1,161,987 tons of high-quality metallurgical coal.

Officers of the company residing at Stone are H. B. Jones, vice president and general manager; W. E. Wheeler, assistant general manager and safety director; and Vance Price, general superintendent.

Field Performance Report

# Users confirm that DOUBLE GRAY-X® Wire Rope lasts longer on tough jobs

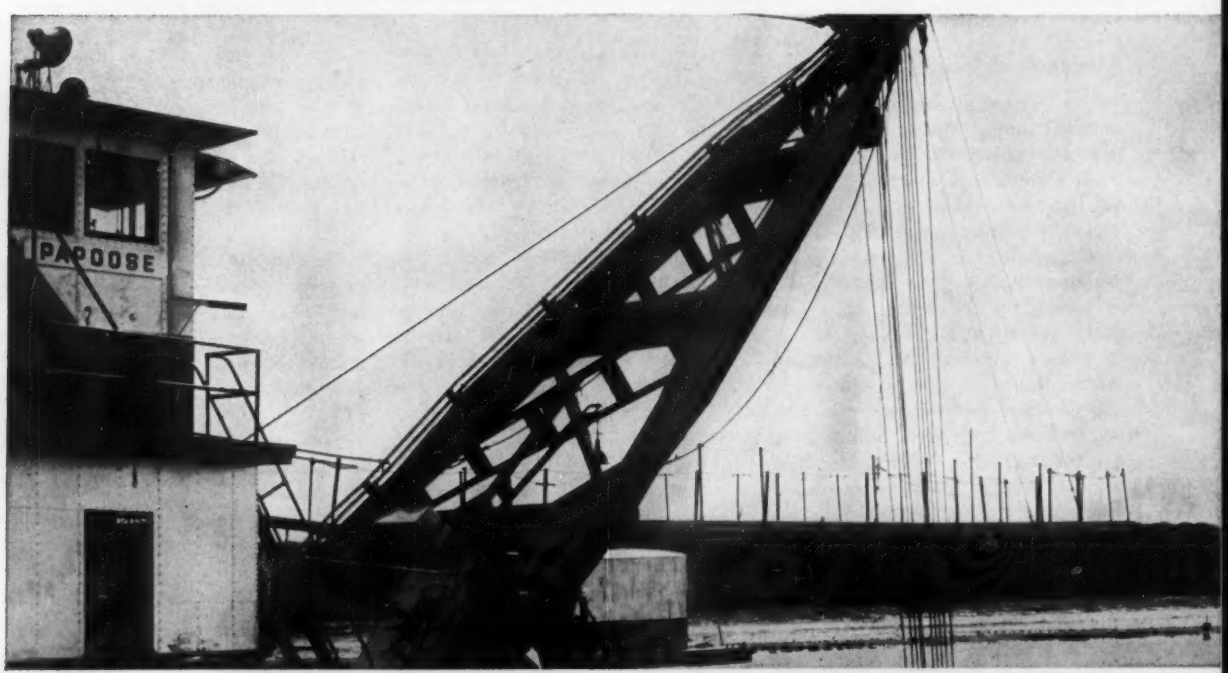
Field reports are now coming through on CF&I-Wickwire's superior new wire rope—Double Gray-X. These reports, a few of which are summarized here, all agree on one point — when the going really gets tough, Double Gray-X lasts longer than other wire ropes.

Double Gray-X is the result of CF&I's intensive research program leading to the discovery of a remarkable new wire-drawing technique. This process includes the use of Molysulfide* in the lubricant, which creates a *permanent molecular shield* around the individual wires, resulting in these benefits:

- **reduced friction between individual wires in every strand of Double Gray-X during service;**
- **smoother wire surface, which helps eliminate the "weak links" that can cause breakage and impair service life;**
- **greater resistance to abrasion, crushing, bending.**

And—in addition to longer life—Double Gray-X gives you extra strength. Made of extra-improved plow steel with an independent wire rope core, this rope gives 15% higher breaking strength than the catalog breaking strength of an improved plow steel rope with IWRC.

Double Gray-X is made in a wide range of sizes and constructions. It's available from CF&I-Wickwire's chain of warehouses and nation-wide network of distributors. For complete details, call the nearest CF&I sales office or a Wickwire Rope distributor.




**REPORT: ON THE SACRAMENTO RIVER,** two dredges – the *Papoose* and the *San Diego*—are sucking up tons of silt to help make Sacramento a seaport. Both use Double Gray-X for lines on swings, spuds and ladders.

Captain Nick Carlson of the *Papoose* (Hydraulic Dredge Company) says: "The Double Gray-X rope that holds the suction head really takes a beating on both spud and swing lines, but it's still in fine shape. However, another brand of wire rope put in at the same time is beginning to show wear."

Captain Ralph Vea of the *San Diego* (Pacific Dredging Company) reports: "When you're down with rope failure in this business, you're really out of production. But Wickwire Rope, which we have been using for nineteen months, really keeps us going. We used to change swing lines every six weeks, but the Double Gray-X we have on there now has been in service nine weeks already. That new protective shield on the rope really does the job."

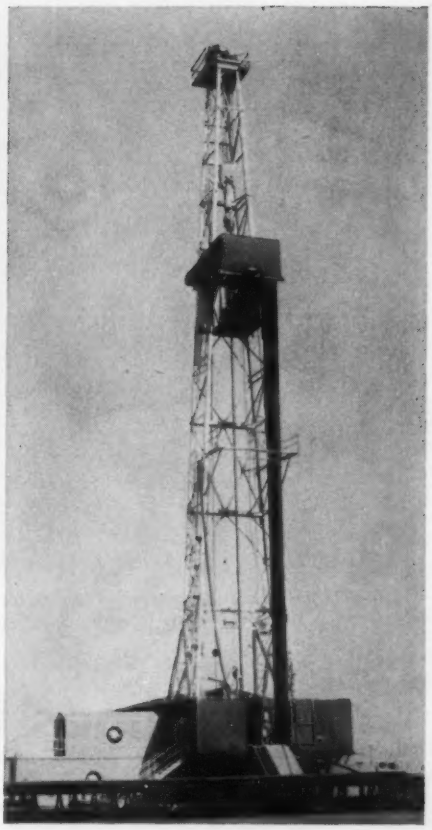
*Registered Trademark of Climax Molybdenum Co.

**REPORT:**

**IN THE MOUNTAINS OF COLORADO,** the Hopkins Construction Company relied heavily on Double Gray-X on "two of the toughest construction jobs we ever handled." Both required the moving of more than 300,000 cubic yards of material. Many different types of earth-moving equipment, including the power shovel pictured above, were equipped with Double Gray-X — with these results:

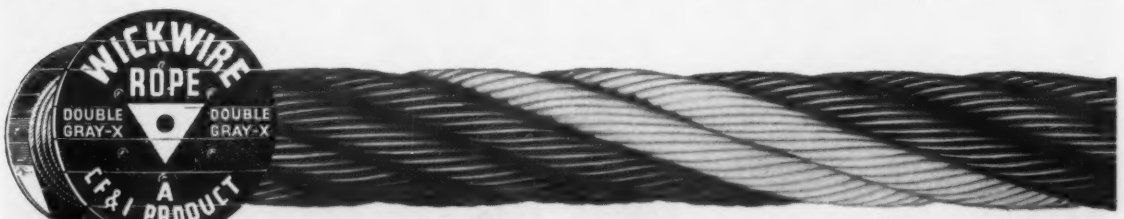
President Hopkins: "Every minute of working time counted on the Cheyenne Mountain job because we faced a $5,000-a-day penalty if we didn't finish it in 45 days. The service we got from Double Gray-X was wonderful. We didn't lose 1% of downtime because of rope failure — and we completed the job in exactly 45 days."

Duane Rundle, Project Superintendent on the South St. Vrain Canyon job: "Rope life has been improved and downtime cut drastically since we switched to Double Gray-X. Maintenance is no problem at all. We just grease the rope when needed."



**REPORT:**

**ON ROTARY OIL RIGS** of the Falcon Seaboard Drilling Company, a prototype of Double Gray-X underwent tests that put wire rope to the most extreme abuse. Mr. Jack Starr, Vice President in Charge of Drilling, comments: "The results obtained with the original prototype of Double Gray-X led to our decision to order a carload of this improved product. Falcon Seaboard insists on the best products to serve the oil industry in accordance with today's modern standards."




**WICKWIRE ROPE**

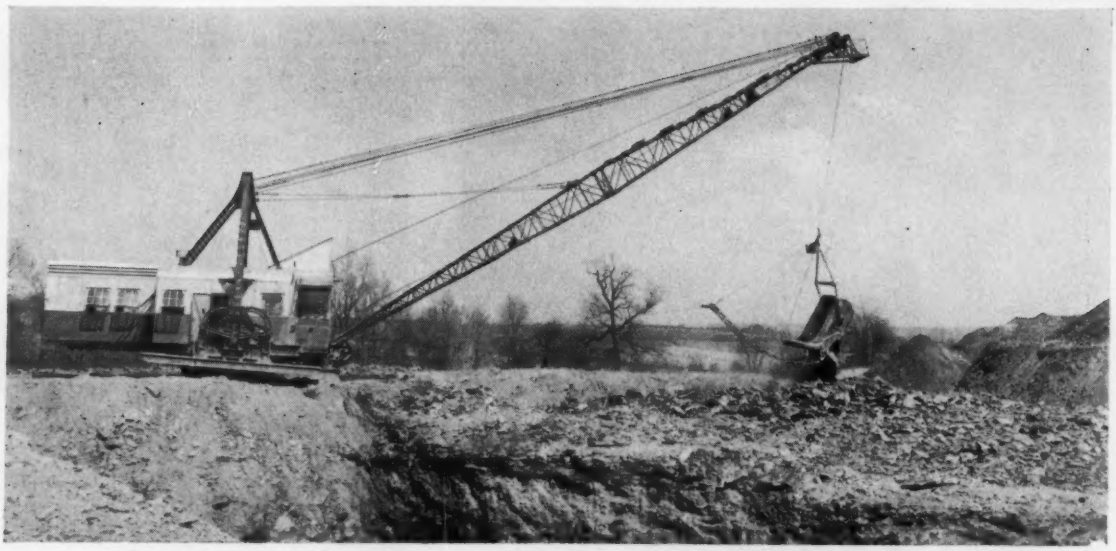
**THE COLORADO FUEL AND IRON CORPORATION**

CF&I STEEL

*In the West:* **THE COLORADO FUEL AND IRON CORPORATION** — Albuquerque • Amarillo • Billings • Boise • Butte Denver • El Paso • Farmington (N. M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland Odessa (Tex.) • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro Seattle • Spokane • Tulsa • Wichita

*In the East:* **WICKWIRE SPENCER STEEL DIVISION** — Boston • Buffalo • Chattanooga • Chicago • Detroit Emlenton (Pa.) • New Orleans • New York • Philadelphia

7750



**SECOND STRIPPER** swings 6½-yd bucket from 100-ft boom in second pit. Unit makes 30-ft wide key cut 300 ft long next to highwall before removing outer portion of overburden. Both draglines uncover 100-ft strip of coal.

# Draglines Pace Flexible Thin-Seam

Employing 12- and 6-yd draglines as major stripping units in two pits, Copperhead Coal Co. recovers 1,000 tpd from the the Ohio Nos. 5 and 6 seams. Big bulldozers add flexibility to operations.

VERSATILITY and flexibility in pit operations are the key to successful thin-seam mining at the Copperhead Coal Co., Sugarcreek, Ohio. The company couples a 12-yd Page 728 diesel dragline with a 6½-yd Monighan dragline to recover 1,000 tpd. In producing this tonnage, the company relies on the Page 728 with its 12-yd bucket to carry the major stripping load in the thicker cover and the 6½-yd dragline to work in the thinner cover.

**AMMONIUM NITRATE** is distributed and treated with oil near end of shift. Holes receive 300 to 350 lb of mixture.

**PRIMERS** of 60% dynamite are laced on detonating fuse and equally spaced in column of nitrate-oil mixture.

**BULLDOZER** levels spoil from upper seam to provide working bench for 12-yd diesel dragline in background.

**VERTICAL AUGER** sinks 8-in holes on 20-ft centers in three rows 20 ft apart. Two men drill 400 ft of hole per shift.

# Stripping

Most of the company's output comes from the Ohio No. 5 seam which is about 36 in thick. But stripping becomes a two-seam operation in the higher hills where the No. 6 seam lies 50 to 60 ft above the No. 5. The No. 5 coal is firm and comparatively uniform in thickness and has no bands of impurities cutting through it. The No. 6 coal is only 28 to 30 in thick.

Overburden, beginning on top of No. 5 coal, includes 30 ft of shale and 20 ft of fireclay and shale, or shale and sandstone if the No. 6 coal is absent. The No. 6 coal is covered by 12 to 16 in of black shale, then sandy shade and a thin layer of dirt to the surface.

## Preparing the Overburden

Where the No. 6 coal is present, the overburden usually is soft enough to be removed without the aid of explosives. The stripper throws the No. 6 overburden over the hillside and on top of the No. 5 outcrop. After the No. 6 coal is recovered an Allis-Chalmers HD 21 bulldozer with a torque-converter drive and an HD 20 bulldozer team up to cut down and level the overburden previously cast downhill from the No. 6 seam. This leveled material provides a working surface for drilling the overburden on the No. 5 coal and for operation of the dragline while it uncovers the No. 5 coal.

Two men, employing a truck-mounted McCarthy vertical auger on single shift, move in on the leveled material and sink three rows of 8-in holes on 20-ft centers. Rows also are

**CLEANUP WORK** along toe of highwall ahead of coal loader in larger pit is extra assignment for second coal shovel.

**DESTINATION** of 20-ton coal hauler is 600-ton hillside bin 4 mi from the pit. Company has five trucks serving two pits.

**TANDEM TRAILERS** transport coal from storage bins to customers in nearby industrial cities. Storage bins hold 1,600 tons of coal.

spaced 20 ft apart and holes in alternate rows are staggered. Holes penetrate only to within 6 ft of the top of the coal to prevent shattering of the thin seam by explosives. Two drillers sink an average of 10 holes 40 ft deep each shift. If only the No. 5 coal is present, the bulldozers cut drillroads in the side of the hill above the outcrop.

Toward the end of each shift, the drillers help charge the holes with a mixture of ammonium nitrate and fuel oil. Each hole receives 300 to 350 lb of the mixture and three primers of 60% dynamite, which are laced on detonating fuse and equally spaced in the column of nitrate-oil mixture. The primers make up 8 to 10% of the total charge in each hole.

The fuel-truck driver distributes 80-lb bags of Spencer N-IV ammonium nitrate to each hole. He then adds 3 to 4 qt of fuel oil to each bag before moving to the next hole. When all of the nitrate has been distributed, the drill crew joins him to help charge the holes. All holes are laced with detonating fuse, connected in series and detonated with a single cap.

## Uncovering the Coal

Powered by a 900-hp diesel engine and swinging its 12-yd bucket from a 150-ft boom, the Page 728 dragline uncovers a strip of coal 100 ft wide. It works round the clock six days per week in banks up to 60 ft high while exposing 15,000 tons of coal per month.

In removing the broken overburden, the 12-yd stripper first moves to a point 50 ft from the edge of the cut and digs out a 50x50-ft block of overburden along the edge of the highwall, spoiling it in the empty pit, adjacent to the spoil. This fill material provides a working place for the dragline in the pit from which position it takes out the 50x50-ft block of overburden nearest the pit. After completing these two steps, the dragline has exposed a 100x100-ft area of coal.

The dragline then walks back to the center of the broken overburden and repeats the cycle, again starting with a 50x50-ft block along the highwall and then moving onto the fill for the next 50x50-ft block. Stripping thus alternates from side to side for the full length of the pit. The coal-loading shovel follows the stripper at a considerable distance.

The 5W dragline, which swings a 6½-yd bucket from a 100-ft boom, works two shifts in a second 100-ft-wide pit in a somewhat different manner. The 6½-yd machine also begins at the inside edge of the shot bank, but makes a key cut 30 ft wide about 300 ft long. As the dragline removes the key cut, the 5W walks back on the material over the surface to provide a solid roadway for removing the outer portion of the overburden. Some of the material is also cast into the old pit. After reaching the end of the key cut, the 5W walks back on the outer-portion of the broken over burden to a point opposite the starting point and digs out the remaining 70 ft of the cut. After removing this material to the end of the 300-ft key the dragline starts a new key cut.

Management uses several machines for cleanup work along the edge of the highwall and to remove fine dirt ahead of the coal shovels. The coal-loading shovel picks up any loose rock at the toe of the highwall and casts it to the edge of the spoil. To speed this work, the company sometimes shifts a coal shovel to cleanup work. A Hough front-end loader then skims off fine material on top of the coal before final cleaning with a power sweeper.

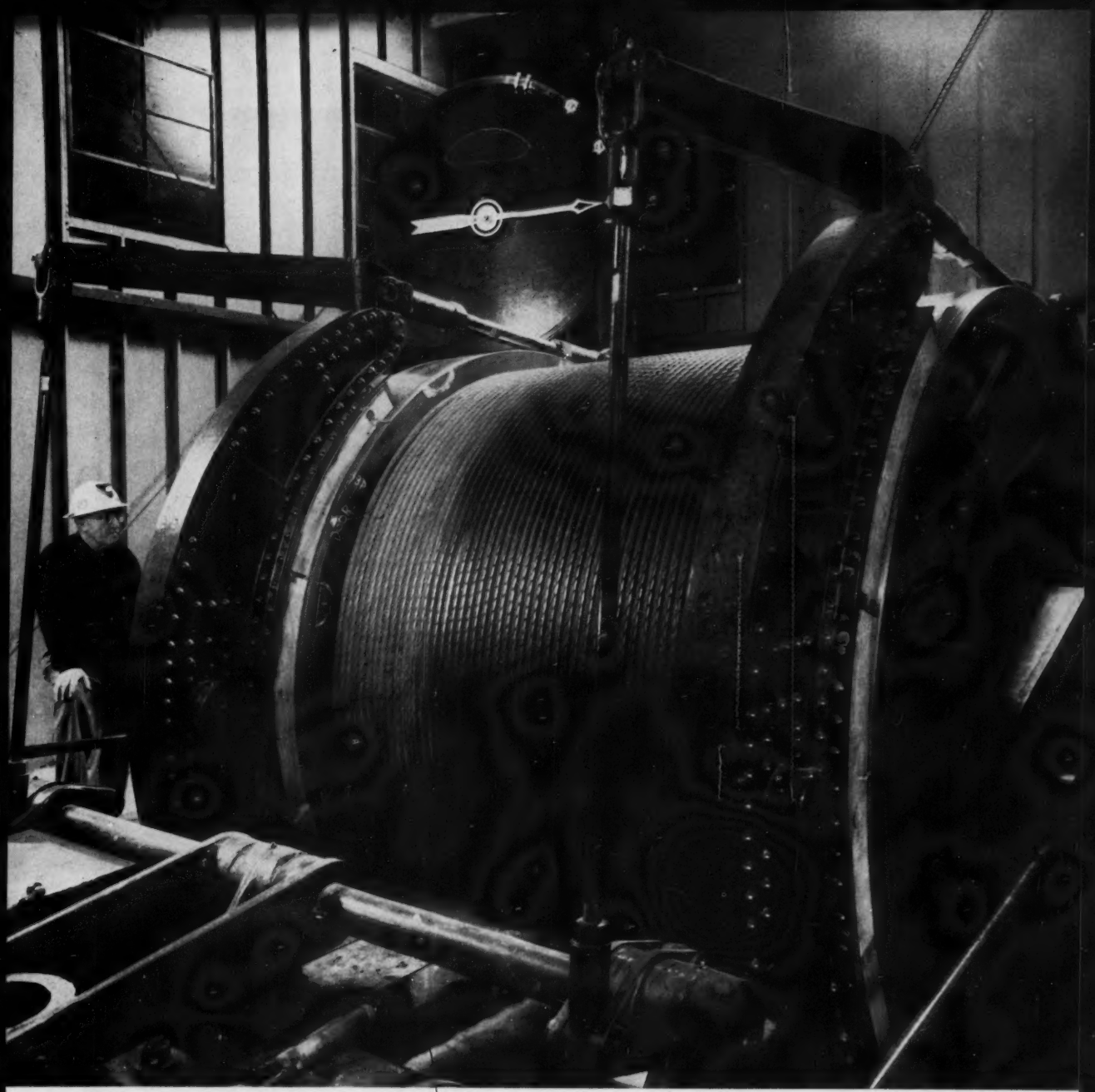
## Loading and Hauling

A Northwest 80D with a 3½-yd Esco dipper loads coal in the Page 728 pit and a Manitowoc 3000 with a 2½-yd Esco dipper serves the 5W pit. Both shovels work a single shift but one unit sometimes may be temporarily assigned to cleanup work ahead of the other shovel.

Five Mack tractors pulling 20-ton enddump semitrailers carry coal 4 mi over company roads to the tipple. There they discharge into a 600-ton bin feeding the plant.

Roads, 50 ft wide, are built on a 2- to 3-ft base of sandstone and shale. After this material is compacted, the company adds a layer of gravel or slag for the final running surface. An Adams grader regularly travels the roads to maintain a smooth running surface for the coal trucks.

Coal feeds from the storage bin to a pair of flight conveyors discharging onto a shaking screen making a separation into plus 4-in lump, 4-in egg and 2-in nut and slack. The lump and egg sizes may be diverted to a Jeffrey hammermill and reduced to nut and slack. Each of the screen products flows to a compartment in a 1,600-ton storage bin. Virtually all of Copperhead Coal's production travels by truck to customers in nearby industrial cities.



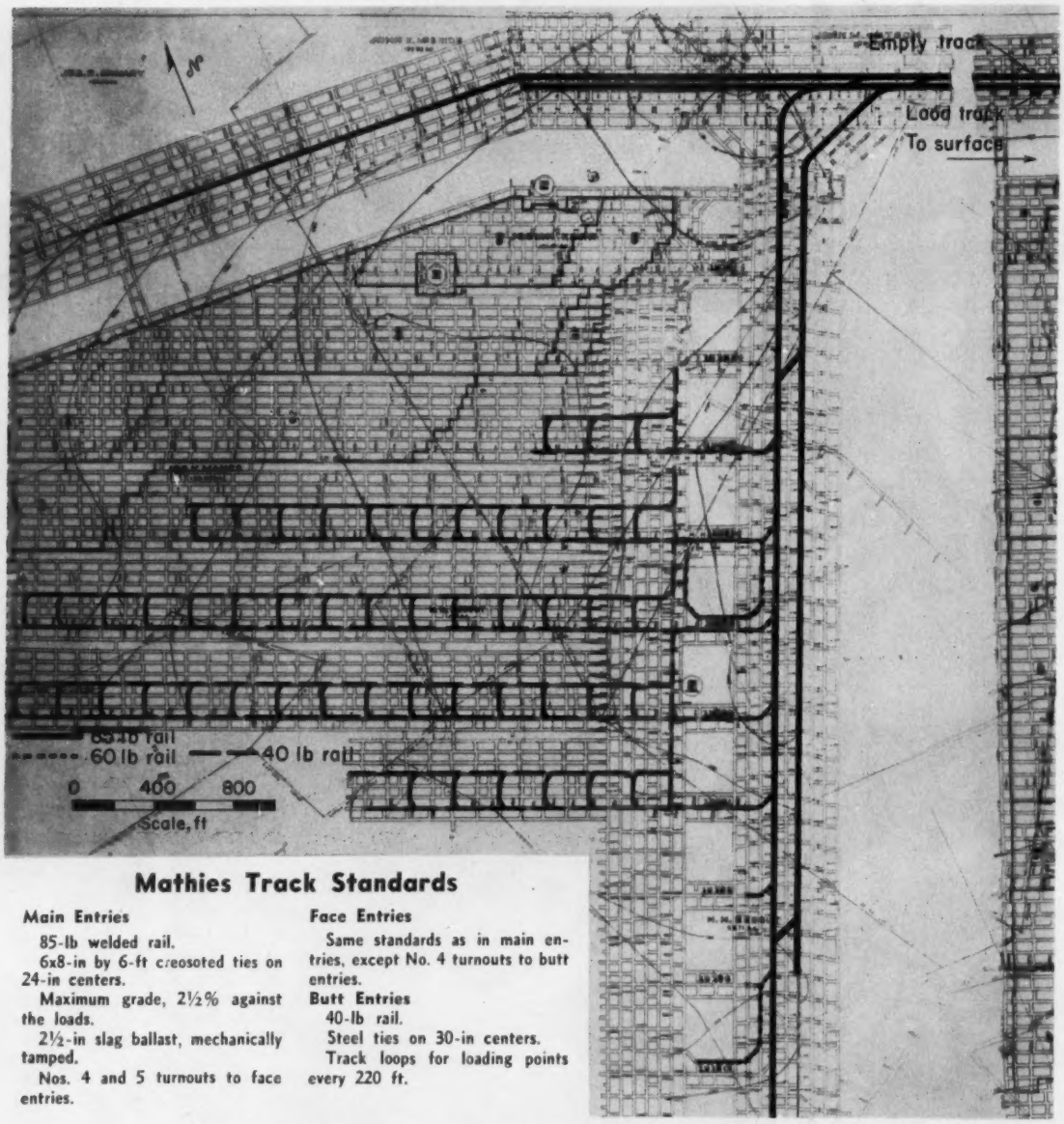
**Bethlehem Rope Gets Workout in Mine Shaft.** Here's a drum of wire rope that's giving a good account of itself. It's a 1½-in. Bethlehem line, photographed after it had experienced strenuous service for several months in a 19-ft-diameter shaft in a mid-continent mine. As you can see, the rope appears to be in excellent condition.

You'll find Bethlehem Wire Rope a willing worker in scores of applications in and about the mine. It's as dependable as the day is long, and can be counted on to lift tremendous tonnages.

Bethlehem Steel Company, Bethlehem, Pa. *Export Distributor:* Bethlehem Steel Export Corporation

*Wire rope mill depots and distributors from coast to coast stock Bethlehem Rope*

# BETHLEHEM STEEL




## Mathies Track Standards

**Main Entries**

85-lb welded rail.

6x8-in by 6-ft creosoted ties on 24-in centers.

Maximum grade, 2½% against the loads.

2½-in slag ballast, mechanically tamped.

Nos. 4 and 5 turnouts to face entries.

**Face Entries**

Same standards as in main entries, except No. 4 turnouts to butt entries.

**Butt Entries**

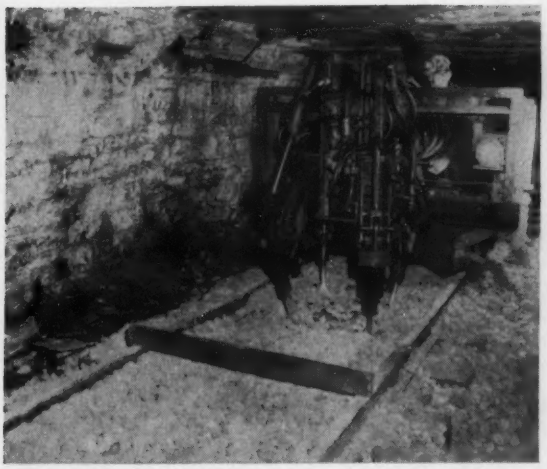
40-lb rail.

Steel ties on 30-in centers.

Track loops for loading points every 220 ft.

**HAULAGE PLAN** includes two roadways of all-welded 85-lb tracks on all main entries, 60-lb rail in face-entry sidetracks and 40-lb loop system in butt entries. Big 50-ton locomotives pull 50-car trips at 20 mph.

**TROUBLE-FREE HAULWAYS** at Mathies mine result from building roadways to near railroad standards. Features include all-welded 85-lb rail, treated ties, mechanically tamped slag ballast and grades under 2½%.



**MECHANICAL TAMPER** on self-propelled truck enables two men to align and tamp 418 ft of track in one shift.

**SPECIAL** four-compartment cars, loaded by gravity through a borehole fed by a 40-ton surface bin, carry ballast.

# Underground Railroading at Mathies

Application of labor-saving methods, including mechanical tamping and improved rail welding, plus rigid standards for initial installation enables six men to handle extension and servicing of 54 mi of track at 18,000-tpd mine.

A MECHANICAL TRACK TAMPER and an improved method of welding rails, plus application of methods designed to get the most from haulage equipment, pave the way for underground railroading at Mathies Coal Co., Finleyville, Pa.

The Mathies haulage system—54 mi of track—handles 18,000 tpd in three-shift operation. Coal travels from the section to the surface in 10-ton cars, 50 in a string, pulled by General Electric 50-ton locomotives at speeds up to 20 mph.

The main haulage consists of two independent 10-mi parallel roads. There are 20 mi of track in the face entries and 14 mi in the butt entries.

Six men, split up into three two-man crews handle installation and servicing of this track network. Mathies is able to handle this task with only six men because of the rigid standards set for initial installation plus recent application of labor-saving methods, including a Fletcher mechanical tamper and the improved Thermit Self-Preheat rail welding.

To provide a trouble-free haulway that requires a minimum of maintenance, Mathies lays track to near railroad standards. For example, no mainline grade against the loads is greater than 2½%, and all mainline track is welded 85-lb rail laid on treated ties and ballasted with mechanically tamped slag. Mathies management notes that taking pains in the initial installation more than pays for any additional expense. For example, much of the main haulway has been in service 10 yr and has required little or no maintenance other than routine cleanup.

## Laying Track

To simplify laying of permanent track Mathies has set up a step-by-step plan for replacing 40-lb temporary track. First, the mine supply crew delivers 85-lb rail along a 1,000-ft section of temporary track, taking care to place the rails on wood blocks so that the track crew can move them easily. The supply crew also stacks 6x8-in creosoted ties in breakthroughs.

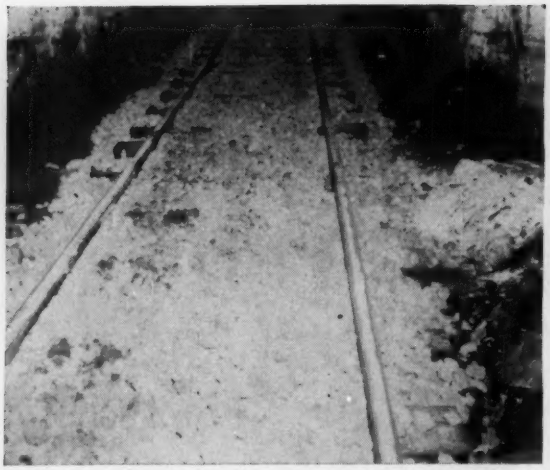
In tearing up the temporary 40-lb roadway, the crew begins at the inby end of the section to be replaced. The night supply crew redistributes the 40-lb rails, ties and plates to butt entries. After completely tearing up a 1,000-ft section of track, the two-man crew uses a Joy 8-BU loader to clean up the roadway. This material is stacked up along the rib opposite the stored rails.

Starting at the outby end the two men place treated ties on 24-in centers. Then they slide 85-lb rails from their resting places on the wood blocks onto the ties and spike them to 44-in gage. Ties at the joints are left upspiked so molds for Thermit welding can be placed at the joint. A 3/8-in space is left between rail ends. Then ties are blocked up to bring the rails to the proper grade before they are spiked. As soon as enough rails are spiked in place the two men plan a full shift of joint-welding, usually on an idle day.

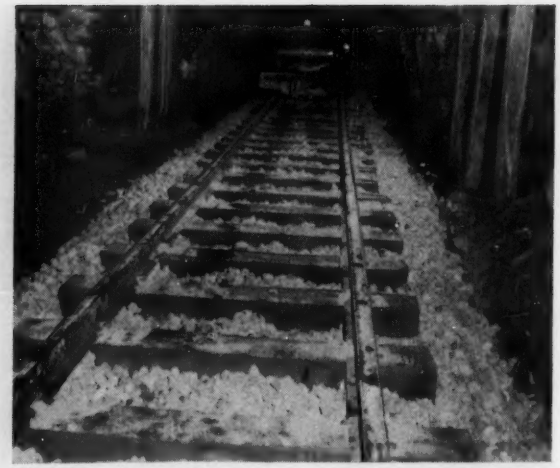
## Low-Cost Ballast Handling

Ballast is delivered to the new track in special four-compartment Irwin-Sensenich ballast cars. These units are loaded by gravity through a borehole fed by a 40-ton surface bin. The borehole intersects the mine at the center of track heading. Ballast flow to the cars is controlled by an undercut gate.

Supplymen distribute the ballast



**BEFORE TAMPING,** ballast looks like this. Slag is spread by ballast car, then bulldozed with tie ahead of motor.



**AFTER TAMPING,** ballast is near bottom of ties. More ballast is added to bring final level up to top of ties.

along and between the ties of the spiked and leveled track. It then is leveled by a locomotive pushing a tie on top of the rails. Final leveling, alignment and tamping of track is assigned to the two men who operate the Fletcher tamping machine. These two men have tamped 209 ties, or 418 ft of track, in 263.36 min or 1.26 min per tie.

Five men formerly aligned and tamped 100 ft of track per shift. Thus the improvement is from 20 ft per man-shift to 209 ft per man-shift. By adding a third man to the crew to eliminate the need for stopping the machine to help align and jack the track in place, 144 ft more could be tamped per shift.

## Better Welding

Mathies uses the new Thermit "Self-Preheat" process to weld the rails together. Greatly simplified, the system employs the heat of the Thermit reaction to preheat the ends of the rails so that heating with vaporized kerosene, the most time-consuming part of the old-type Thermit welding operation, is now eliminated.

Two men now can make 10 joints per shift. With the old Thermit system six men could make only six joints per shift. Cost per joint now is $14.40, for labor and materials.

Several advantages cited for welded, continuous rail are as follows:

1. Significant reduction in track maintenance because there is no upkeep at rail joints. There are no plates, bonds or lock washers to require attention or renewal.

2. Continuous, permanent high conductivity with no power loss which results from loosened bonds, a frequent problem with mechanically joined track.

3. Longer rail life, because rail ends are not battered.

4. Less spillage and higher operating speeds.

5. Less wear and tear on cars and locomotives.

## The Tamping Machine

The Fletcher track tamper, consists of a self-propelled truck similar in design to a track-mounted roofbolter, and a horizontal sliding head that holds and positions the tamping tools. The sliding head is similar to the slide of a Fletcher roofbolter. Other important components are two hydraulic track-leveling jacks and two hydraulic track-clamping hooks.

The tamping tools are air-powered but their positioning is done hydraulically through an elevating jack and the cross slide. By shifting the head, either end of the tie can be tamped. Centrally located controls make possible one-man operation. A compressor mounted on a separate truck provides air for the tamping mechanism and a line oiler lubricates the hammers while they are operating.

The track tamper has four pneumatic hammers, two for each side of the tie. It takes 125 cfm of air at 85 psi to operate the four hammers, each of which strikes 1,400 blows per minute with a force of 11½ lb. Tampers can penetrate 2¼ in below a 6-in tie used with 85-lb rail.

Aside from using the track tamper on new track, mine management expects to put it to work reconditioning roadbed and track that have been in service for a number of years. Low spots can be readily raised to grade by spreading new slag between the rails and the top of the ties. Then by using the rail clamps the rail and ties can be raised to the desired elevation and immediately tamped. With this unit, management says that two men on an idle day can recondition several hundred feet of track.

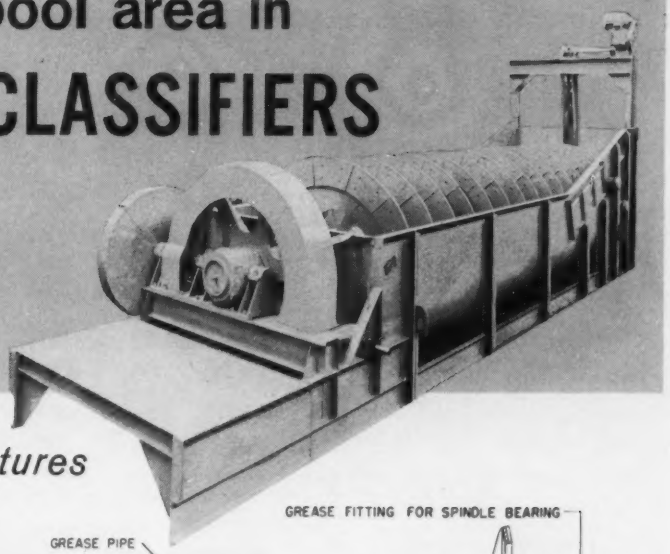
For several years the Mathies alignment and tamping crew consisted of five men. One of the crew handled the lifting jacks for leveling and aligning rails and the other four men used pneumatic tampers to pack the ballast densely under the ties. Since some pieces of the slag were as much as 2½-in in diameter, the tamping job was laborious and time consuming. But this effort was required to install track of Mathies standards, which were set for hauling high tonnage and long life.

As the track network expanded over the years and wages increased, management faced the problem of adding more men and ensuing higher track costs, unless a mechanical method could be developed. Mathies officials had studied mechanical methods in use in railroad construction and were particularly impressed by mechanical ballast tampers. A study of the railroad tamping unit showed that

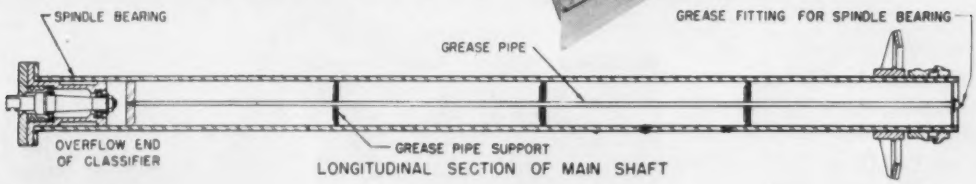
# Large working pool area in AKINS COAL CLASSIFIERS

*gives lower cost*

- **DEWATERING**
- **SIZE SEPARATION**



## *Other Exclusive Akins Features*



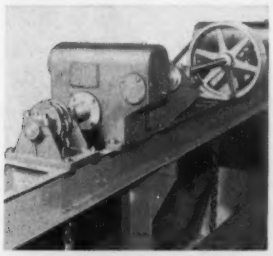
LONGITUDINAL SECTION OF MAIN SHAFT

### SUBMERGED BEARING

The patented submerged bearing has proven its advantages of durability, trouble-free operation, and ease of maintenance.

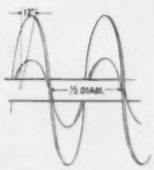
### LUBRICATION

The submerged bearing is grease-gun lubricated through a pipe in the main shaft; thus the pipe is isolated from tank contents and protected against breakage. Grease fitting is at upper end of shaft for maximum convenience.



### MECHANICAL LIFTING MECHANISM

The lifting device consists of chains, chain sprocket sheaves, and motor-driven or hand-operated reducer unit. Experience has proven this mechanical arrangement to be the most positive, with no possibility of slippage. Minimum maintenance. No packing glands or rods to become worn.



### SPIRAL PITCH

50 years of experience has shown that the half-diameter pitch gives maximum raking capacity and results in less slippage and less wear than advanced pitch spirals.

### TANK SUPPORTS

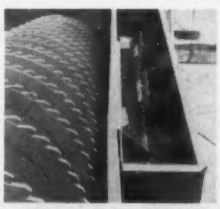
Web beam substructure supports tank. There's no load to be carried by tank. This also reduces installation cost by eliminating need for extra sub-structures to support tank.

### DRIVE

The bevel gear, V-belt drive has proven to be the most trouble-free and flexible. It permits mounting the motor, or motor-reducer, horizontally; and changing speeds quickly and inexpensively, by simply changing V-belt sheave ratio.

### WEARING SHOES

Wearing shoes are made of various alloys, including Climax 42-A. Patented serrated wearing shoes are available for special applications. Special inner shoes are provided for heavy rake loads.



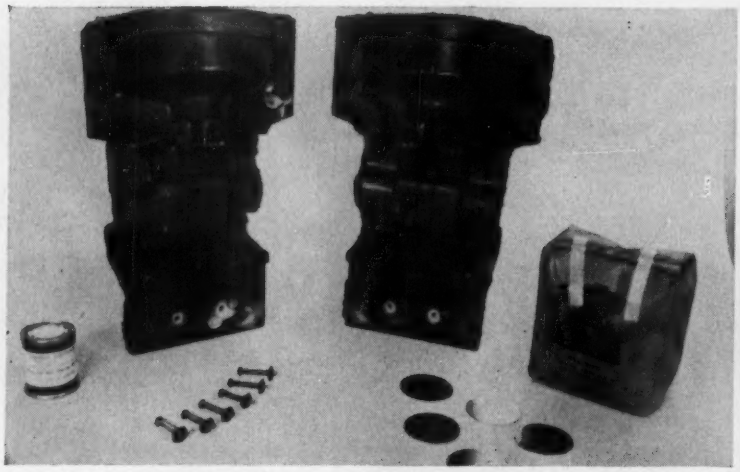
*The Company that cares enough to give you the best!*

*Manufacturing Division*

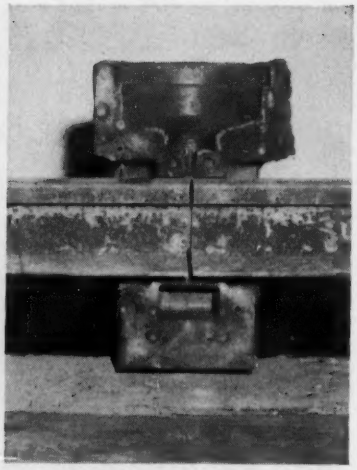
**MINE AND SMELTER SUPPLY CO.**

DENVER 16, 3800 RACE ST. · NEW YORK 17, 122 E. 42nd ST. · SALT LAKE CITY 1, 121 W. 2nd S. · EL PASO, 1515 11TH AVE. · ALBUQUERQUE, 701 HAINES N.W.

**Licensed Manufacturers and Sales Agents** in Canada, Australia, Sweden, England, South Africa
**Sales Agents** in Peru, Chile, Philippine Islands, Japan, New York City (for Continental Europe) and in principal cities of the United States.



**MATERIALS** for simplified preheatless rail-welding process include two-section mold with bolts, metal discs, welding and starting powders.



**EXPENDABLE** two-piece molds are carefully centered on ⅜-in rail gap.

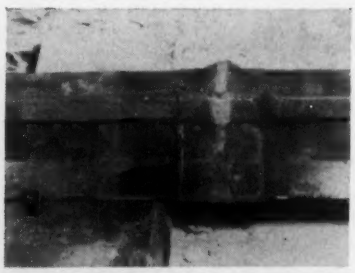
its tamping head could be adapted to coal-mine track construction. The upshot was that Mathies enlisted the aid of J. H. Fletcher & Co. in the development of a mine tie tamper. Fletcher engineers came up with a Model TTA tamper now used at Mathies. Results achieved with the machine have been gratifying to management and have fulfilled expectations.

## Maintaining Haulage Equipment

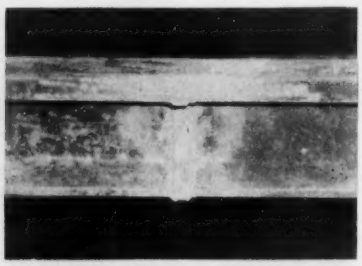
Mathies management pays as much attention to keeping haulage equipment in top operating condition as it does to building track. For example, defective car wheels or trucks are detected automatically as cars leave the rotary dump at the preparation plant. In addition, a shop-made device is used to detect bent axles. A rail washer on 50-ton locomotives removes sand from the rails to decrease rolling friction of mine cars. And wheel flange oilers are being installed at 5-mi intervals to reduce friction between flanges and rails.

Before installing the defective-wheel detector the company had experienced some difficulty in pulling trips through the dump with a car haul. As a result of this difficulty all cars were given a thorough inspection which revealed an assortment of troubles, including bent axles, double-flanged wheels, bad bearings and broken springs. Although cars were given regular visual inspections while on the track, it was virtually impossible to detect the defects that were spotted when cars were gone over with a fine-toothed comb. As a result of the car survey, the company initiated an intensive car-maintenance program which concentrated on rebuilding and replacing car trucks.

**READY FOR MATERIALS,** assembled mold with extension ring has sand tightly packed into space between mold and rail.



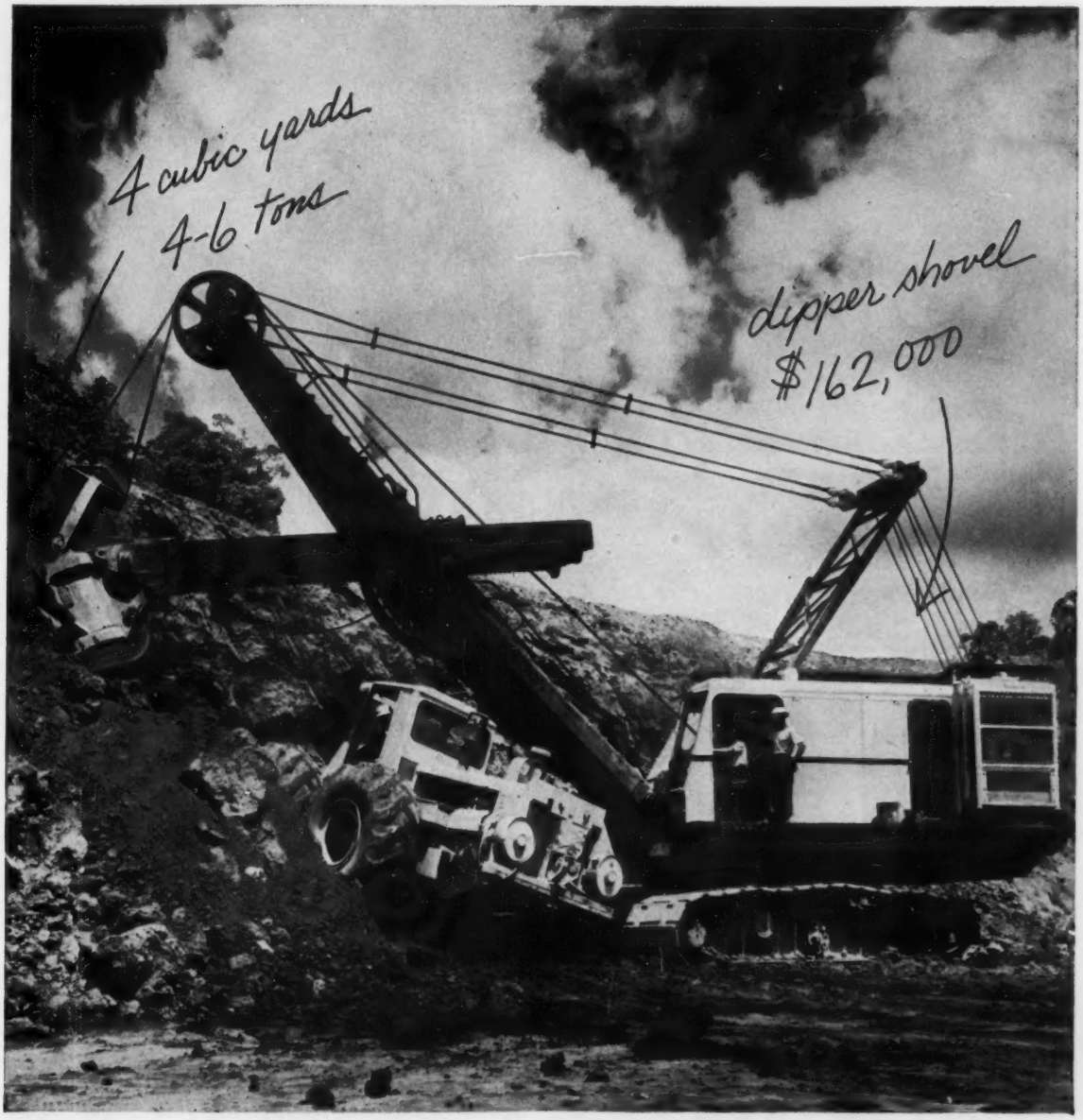
**COMPLETED WELD** with excess metal broken off is ready for grinding with power tool. Joint has high conductivity.



**SMOOTH JOINT** results from grinding top and inner side of weld flush with rails. Two men make 10 joints per shift.

To provide a simple, positive method of detecting defective wheels or trucks, the company purchased an Irwin-Sensenich detecting device that causes a red light to flash in the dump operator's station when a defective unit moves out of the dump. Simple in design, the device works on the principal that a defective wheel, axle or truck exerts more resistance to rolling than a non-defective unit. As a consequence, the defective unit either pushes against the side of the rail, drags or resists rolling.

The detecting device consists of two 18-in wheel-mounted sections of rail in the empty-car side of the dump. A counterweight pulls each rail section back toward the pump. But if a defective car moves onto the




When you're talking about a $162,000 dipper shovel, you've got to talk about the best rope for it

Talking about or working with, the same thing applies. Anything below Royal Blue's performance level is simply unrealistic. Like looking for a cut-price brain surgeon.

Even at $162,000, the cost of wire rope is important. That's why so-so ropes can cost you more in the long run, because so-so ropes are *short run*. Royal Blue, on the other hand, is built by America's oldest manufacturer of wire rope to last, to do the job without a whimper. Here's why.

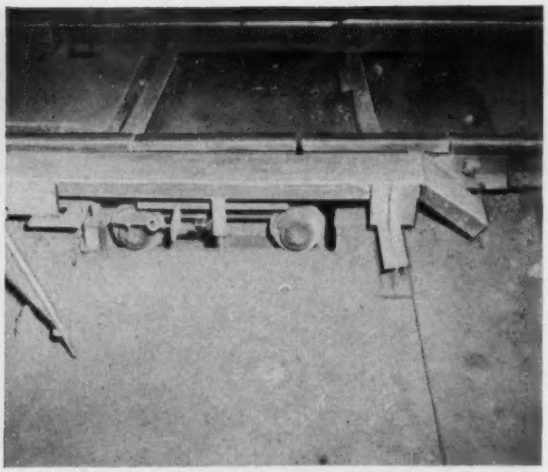
Royal Blue is made from the toughest rope wire ever made—Type 1105—extra high-strength improved plow steel. This pedigree gives to the rope qualities that you can't find in any other rope: exceptional resistance to shock, abrasion, fatigue and impact. Add to these a flexibility that age cannot wither nor hustling fade and you've got a collection of characteristics that make Royal Blue the strongest rope you've ever used.

A $162,000 Dipper Shovel deserves the best and your Roebling Distributor has it . . . Royal Blue. Any inquiries about this high-born rope will be answered immediately by Roebling's Wire Rope Division, Trenton 2, New Jersey.

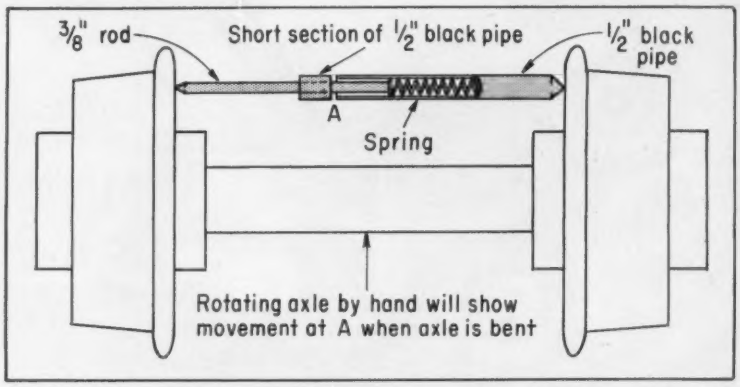
**ROEBLING**

*Branch Offices in Principal Cities*
*John A. Roebling's Sons Division • The Colorado Fuel and Iron Corporation*

**RAIL WASHER** on 50-ton locomotive removes sand from rails, thus providing a smoother surface for easier car movement.



**DEFECTIVE-WHEEL DETECTOR** in rail at rotary dump operates light at dump control, alerting operator to trouble.




**SHOP-MADE DEVICE** makes possible speedy detection of slightly bent axle which is not noticed in visual inspection. Excess flange wear is thus prevented.

short rails the counterweight is not great enough to overcome the additional resistance. Consequently, the rail or rails move forward and the supporting frame contacts a microswitch that completes the circuit to the light in the dump operator's station. The operator thus can mark the car immediately for repairs. The Mathies car-repair shop is located adjacent to the dump so that a defective unit can be taken out of service as soon as trouble is spotted.

Mathies now is replacing all car trucks, and the detector device tells the car repairman which car trucks to replace first. Getting defective cars out of service before failure underground is another important benefit of the detector.

## Bent-Axle Detector

To provide a fast method of checking car axles, Mathies maintenance men developed a simple bent-axle detector. The car repairman places this device between the flanges of two wheels and watches the position of an indicator as they slowly rotate the axle by hand. If the indicator moves as little as ⅛ to ¼ in, the axle is bent enough to cause the wheels to rub the rails and get hot. This misalignment causes flange wear on one wheel and double flanging on the other.

## Rail Washer

Mounted on the rear of each 50-ton locomotive is a rail washer that enables the motorman to remove sand which was laid on the rail to provide better traction on uphill grades. As a result of washing the sand from the rails, the mine cars run easier and thus require less locomotive pull.

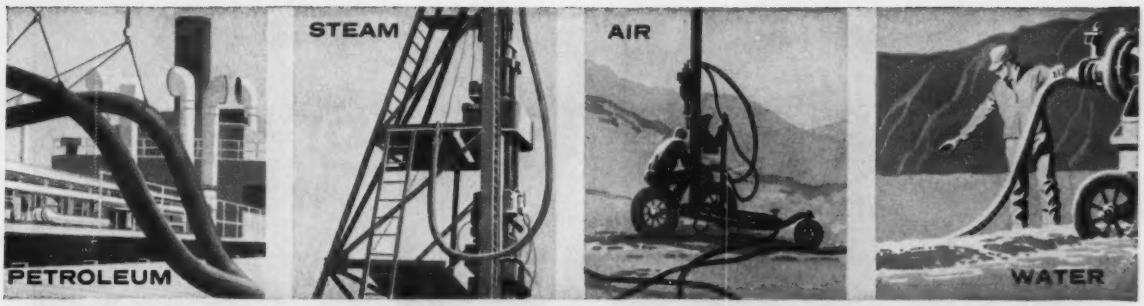
Wash water, stored in a tank mounted on the locomotive, flows to the rails under pressure. To wash sand from the rails the motorman merely opens a valve to deliver the desired volume to the rails. Since the water is under pressure, it strikes the rails with enough force to wash most of the sand away. Compressed air from the locomotive's air-brake compressor keeps the water in the storage tank under pressure.

## Flange Oilers

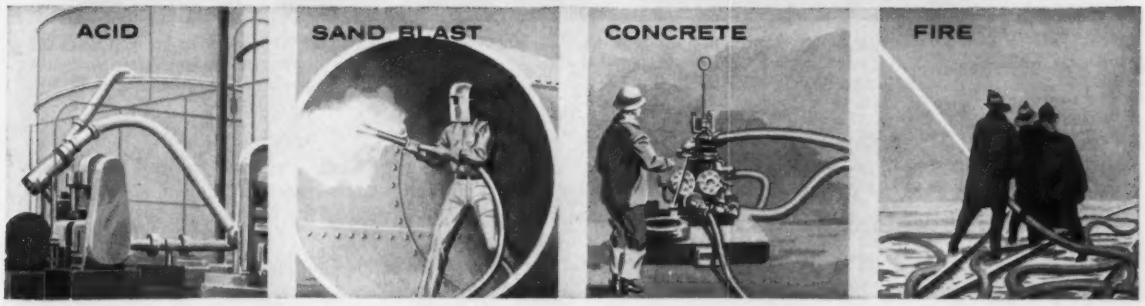
To minimize wheel and axle friction as well as reduce flange friction, Mathies is installing wheel-flange oilers at regular intervals along the track. Present plans call for an oiler every 5 mi, but this distance may increase or decrease according to experience.

Hardsurfacing reconditioned mine car wheels with Stoody 105 is another important phase in providing good haulage at Mathies. This work is done by a contractor who lays the hardsurfacing material on evenly so that no grinding is necessary before wheels are returned to service. As a result of hardsurfacing and the previously described detector devices, wheel consumption has dropped about 50%.

To transport the 18,000 tons of raw material Mathies has 900 U.S. Steel and Irwin steel mine cars, which are equipped with Willison automatic couplers, and four General Electric 50-ton locomotives. A 36-ton General Electric tandem pusher locomotive also is used on a 1-mi stretch of track




# BOSTON HOSE...



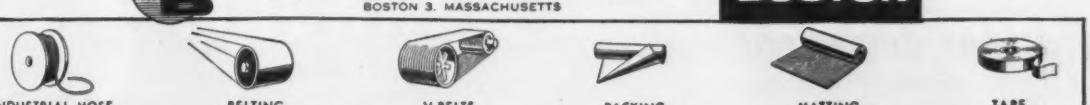

# LONG LINE OF

# TOP PERFORMERS

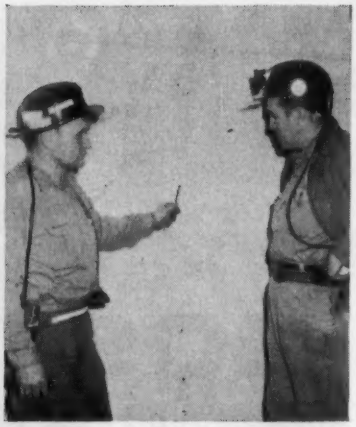
The BOSTON line includes standard and custom-built hose from 3/16" to 42" I.D. Each hose is manufactured to exacting quality standards prescribed by our progressive Research & Development Department. They assure you a superior hose for your most rigid requirements. BOSTON means honest value, top performance—the best hose for your needs. Let us demonstrate how BOSTON serves you best!

AMERICAN BILTRITE RUBBER COMPANY
BOSTON WOVEN HOSE & RUBBER DIVISION
BOSTON 3, MASSACHUSETTS

**BOSTON**



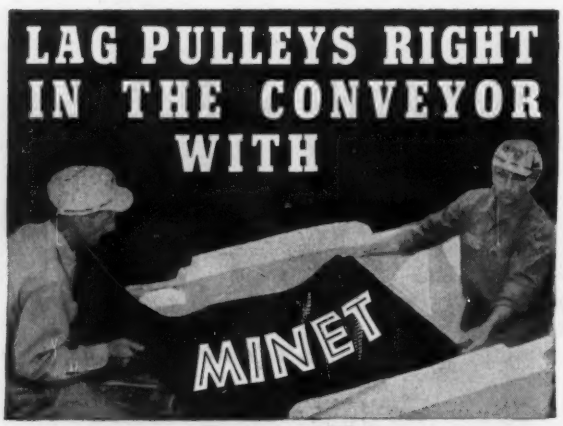
**MEETING** in Mathies office are C. W. Parisi (left), safety director; R. D. Lauder, general superintendent; Max Florjancic, superintendent; James Spiller, mine foreman; and George Resick, state mine inspector.



**STUDYING** mine map are Bill Kebblish (left), underground superintendent, and Max Florjancic, superintendent.

where there is a 2½% grade against the loads. Traveling 15 to 20 mph, the big locomotives can make a roundtrip to the farthest sidetrack in the mine in 1 hr 20 min.

Good power plays an important role in the Mathies haulage system. To provide ample 550-V DC power for the four 150-hp motors in each 50-ton locomotive, the company installs two 1,000-kw rotary convertors in tandem at 8,000-ft intervals on the main haulage. There are additional single conversion units at inby locations in areas not traveled by the 50-ton locomotives. Power is transmitted along the load tracks by a combination of 1-million cir mil feeder and 9-section trolley wire. On the empty road a 500,000-cir mil feeder is combined with 9-section trolley wire.


**Pulley Lagging Method**

**Fast — Economical — Convenient**

The Minet Method of pulley lagging cold bonds tough, long-wearing Neoprene to your steel pulleys. No special tools or skills needed. No need to remove pulley — this means big savings in DOWN TIME.

**An Economical Kit, containing all material needed, and complete installation instructions is available from stock. When ordering, specify thickness of lagging desired, and diameter and face width of pulley to be covered.**

**GENERAL SPLICE CORPORATION**

32 Woodworth Ave., Yonkers, N.Y.
Telephone GReenleaf 6-2211

**WHAT YOU DON'T KNOW HURTS!**

Most key mining officials read COAL AGE because it helps them do a better job.

***If you're not a regular subscriber, Mail this coupon TODAY***

COAL AGE, Fulfillment Manager,
330 West 42nd St., New York 36, N. Y.

Send me COAL AGE for 1 year at $3 (U.S. and Canada only.)
☐ Check enclosed ☐ Bill Company ☐ Bill me

Name ..... Position .....

Mailing Address: ☐ Home ☐ Business

.....

.....

City ..... Zone ..... State .....

Mining Company .....

Hdqs. or Mine Name .....

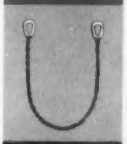
CA860

*To Save Delay, Please Fill Out Completely*

# *All-Americans for a Winning Materials Handling Team*

**These three championship performers give you a materials handling team that is unbeatable... All-American from the basic steel—through the drawing of the wire—to the finished wire rope product.**

All-American No. 1 — Whyte Strand Wire Rope. Inspires other members of your team, brings out the best in them for maximum production at lowest cost. (Write for bulletin 6025.)



All-American No. 2 — The Atlas Sling for the safety spot — lifting and carrying all kinds of loads. Flexible, braided construction provides constant championship performance with unquestioned safety. (Write for bulletin 5308.)

All-American No. 3 — Macwhyte Safe-Lock Cable Assemblies are a triple-threat specializing in uniformity, appearance, and agility... for manufactured products and equipment components requiring the positive performance of a custom-made cable assembly. (Write for bulletin 5601.)

In addition to their outstanding performance on the materials handling and production fields, each one of these All-Americans lives up to these championship qualifications: *Dependability* that is the result of constant uniformity, maintained by rigid quality controls at every step of manufacture. *Experience* that pays off in high production scores... and game-winning play with other members of your equipment team specializing in American rules of the game. *Availability* guarantees the right player for every play, whether at the factory or the warehouse... backed up by expert engineering service. *These All-American products are completely made in the U. S. A.*

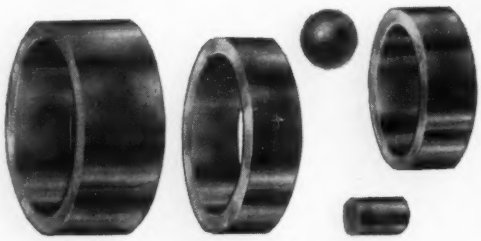
Start now to build up your All-American materials handling team. Your Macwhyte representative will be glad to coach your selections.

**MACWHYTE Wire Rope COMPANY**

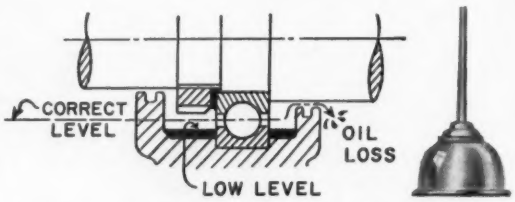
## DISTRIBUTOR DAN, the SKF bearing man, tells

# WHY BEARINGS BECOME OVERHEATED

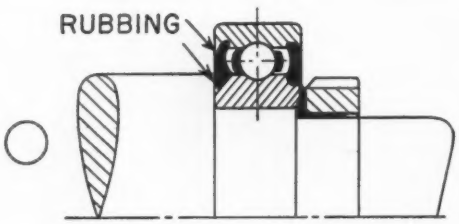
## and how to correct the conditions that cause excessive heat.



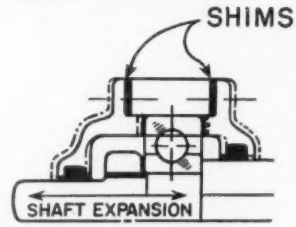
**LOOK FOR THIS SYMPTOM.** Discoloration of a bearing's rings, balls or rollers is a sure sign of overheating. The color is usually a gun-metal blue or bluish black.



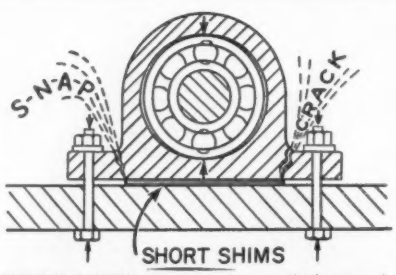

**IMPROPER LUBRICATION OR LUBRICANT** accounts for most cases of overheating. In pillow blocks, if oil is specified, fill only to the center of the lowest ball or roller in the bearing. If it's grease, the lower half of the pillow block should be filled. Therefore, be sure you're using the right lubricant—**in the proper quantity.**




**RUBBING** is a frequent culprit. Check the running clearance of the bearing seal. If it rubs against the shaft shoulder, re-machine the shoulder, to allow proper clearance. Bent lock-washer prongs are sometimes to blame. Straighten them or replace the washer.




**EXTERNAL HEAT,** conducted through the shaft, can make an inner ring expand excessively. It's usually the result of using a bearing with inadequate internal clearance. Make sure the replacement bearing is exactly the same as the original bearing. Should the markings be indistinct, consult an **Authorized SKF Distributor.**



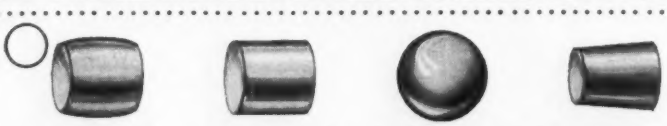

**THE BEARING HOUSING** may be to blame—if it's warped or if the bore is distorted and out-of-round. Check to see whether the bore is pinching the bearing and relieve by scraping the bore. Make sure, too, that the pedestal surface is flat and that any shims cover the entire base area.

**Baffled by a bearing problem? Whether it's selection, mounting, or maintenance—consult your Authorized SKF Distributor. He's staffed to help you keep them running smoothly and he stocks all the bearing types and sizes you need.**

SKF

**AUTHORIZED DISTRIBUTOR**

6010



*Spherical, Cylindrical, Ball, Timken® Tapered and REED Miniature Bearings*

EVERY TYPE—EVERY USE

SKF®

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

®REG. U. S. PAT. OFF.

# Coal, Overburden or Refuse...

# "EUCS" CUT HAULING COSTS

Euclid Rear-Dump and Bottom-Dump Haulers, Scrapers and Crawler Tractors have earned their reputation for more work-ability on scores of open pit operations. Built expressly for off-highway service, they have the speed, capacity and stamina to move more material per shift . . . with minimum downtime and maintenance expense.

The 51-ton Bottom-Dump and Euclid Rear-Dumps with capacities from 10 to 55 tons are top performers on hauling operations. The Bottom-Dump "Euc" is powered by a 380 h. p. engine and has a standard transmission with 9 forward speeds. Rear-Dump models have engines of 132 to 672 h. p. and Torqmatic or standard transmissions.

For overburden removal, building and maintaining haul roads, stockpiling and other open pit jobs, "Euc" Scrapers and Tractors cut costs, too. Three types of self-powered scrapers have struck capacities of 7 to 24 cu. yds. There are two tractor models—the 211 net h. p. C-6 and the big twin-power TC-12 with 425 total net h. p. Both have Torqmatic Drive that provides full-power shift and easy operation.

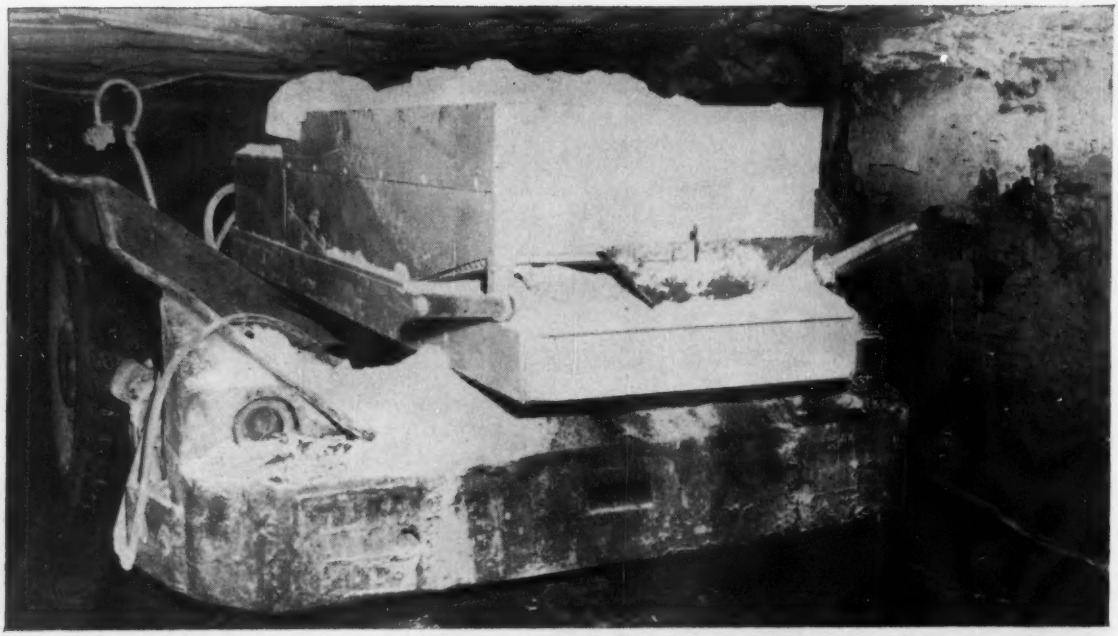
Check the complete "Euc" line for the advantages that apply to your operation . . . a Euclid dealer can show you facts and figures proof that ***Euclids are your best investment.***

**EUCLID Division of General Motors, Cleveland 17, Ohio**

GM GENERAL MOTORS EUCLID

# EUCLID EQUIPMENT

*FOR MOVING EARTH, ROCK, COAL AND ORE*



**SUBSTANTIAL REDUCTIONS** in the cost of rockdusting are achieved with this new unit that fluidizes the dust with air. The 3,200-lb charge in the hopper is applied at a rate of 600 lb per min.

# Better Rock-Dusting Cheaper

Fluidized feeding of rock dust raises tons applied per man-hour 4 to 5 times or more. Further savings through handling in bulk, also using the fluidized principle, should cut total application cost 50% or more.

## Mine Experience . . .

**C. William Parisi**
Director of Safety, Pittsburgh Coal Co., Library, Pa.

APPLICATION of rock dust to the roof, sides, and bottom of a coal mine has hitherto been slow and costly, and consequently in great need of improvement. For example, at a modern coal mine producing slightly over 5,500 tons of coal daily, 3-shift operation, rock dust is applied by hand during the coal-producing shifts and the same area is machine-dusted over the weekend. In this particular mine there are four advancing sections, developing eight headings each, using conventional mining equipment. The face of each heading will advance approximately 100 ft per week in addition to the crosscuts which connect these headings. This means that at the end of each week approximately 1,400 ft of headings and crosscuts must be machine-dusted in each section.

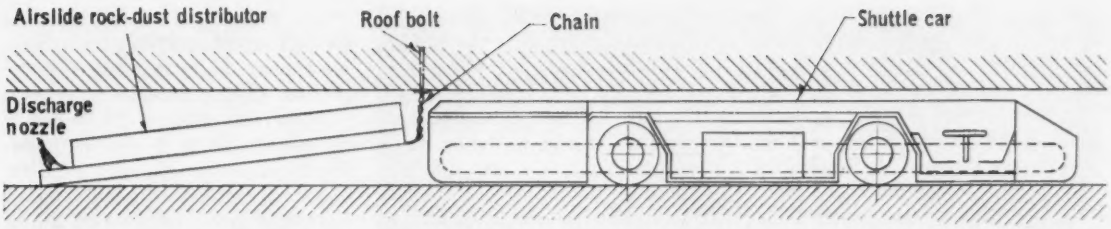
In machine-dusting as done at present, three men are assigned to each section of the mine to be so treated. These men will load the Bantam face duster into a shuttle car and connect the cable of the duster to a power take-off on the car. They then tram the shuttle car to the rock-dust supply truck and load approximately 80 bags of rock dust at 80 lb per bag. When this is accomplished, the shuttle car trams to the face of the last heading on the return side of the section where the dusting is to start.

One man operates the shuttle car, one man handles the discharge hose from the face duster, and the third man rides in the shuttle car to keep the hopper of the duster full at all times. When the 80 bags are used, they return to the rock-dust supply truck and load another 80 bags. This continues until the section is dusted.

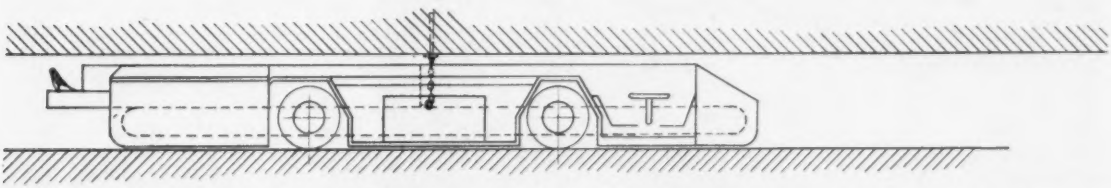
### Cheaper Method Sought

For a long time our company has been interested in the development of a more-economical method of ma-

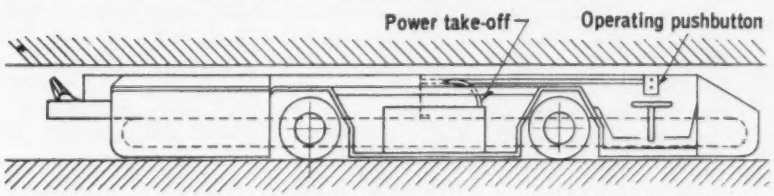
Abstracted from papers presented at the 1960 meeting of the Mine Inspectors' Institute of America.




One end only of rock dust distributor is suspended from roof bolt by a link chain. The shuttle car is driven under the raised end only until the discharge end of the distributor is extending from the shuttle car.



The chain is removed from the distributor. The power cable from the distributor is attached to the power take-off on the shuttle car. The remote-control pushbutton is hung from the side of the shuttle car at the operator's position. Hopper is filled with rock dust and the shuttle car is moved to the point where the dust is to be applied. The pushbutton is actuated, and as the shuttle car moves away from the face dust is discharged at 600 lb per min.




Dimensions of Distributor

| | |
|---|---|
| Width, in | 37 |
| Length, ft | 12 |
| Height (optional), in. | Min. 16 |
| Weight, lb | 2,500 |

Hopper Capacity at Various Heights

| Height, in | Capacity, lb |
|---|---|
| 16 | 1,000 |
| 20 | 1,600 |
| 24 | 2,200 |
| 28 | 2,800 |
| 32 | 3,400 |
| 36 | 4,000 |

**ONE END** of distributor is suspended from roof bolt for drive-under loading of the unit into a shuttle car for rockdusting run. Distributor is removed from car by reversing the procedure and leaving the unit suspended.

chine dusting. With the development of the "Airslide rock-dust distributor" we feel that the first big step has been taken to correct what we consider an inefficient method of applying rock dust.

We acquired a Type S. C. Airslide rock-dust distributor several months ago for use at this mine. Although it has been in service only a short time, the results have been encouraging. The hopper of the Airslide distributor will hold 3,200 lb of rock dust and the machine is capable of discharging approximately 600 lb per min.

At present two men load the Airslide machine into a shuttle car. This can be done in approximately 5 min. The cable is connected to the shuttle-car power take-off and the starting box is placed where it can be safely and conveniently controlled by the operator of the shuttle car. The shuttle car is then trammed to the rock-dust supply truck where two men will empty 40 bags directly into the hopper of the distributor.

One man operates the shuttle car and the rock-dust distributor. While the headings are being dusted the helper moves line brattice to enable the rock dust to cover the rib. When the hopper is emptied, the shuttle car returns for a refill.

Time studies have been made of the rock dusting operation using both the Bantam face duster and the Type S. C. Airslide distributor. In making a comparison of each method average figures are used in the following tabulation:

**Average Performance in Dusting 1,000 Lineal Feet of Headings**

| | Bantam Distributor | Type S. C. Airslide Distributor |
|---|---|---|
| Height of seam, in. | 66 | 66 |
| Hopper capacity, lb. | 160 | 3,200 |
| Height of distributor, in. | 27 | 26 |
| Rated capacity of machine, lb per min. | 80 | 600 |
| Size of rock dusting crew, men | 3 | 2 |
| **Dusting Performance:** | | |
| Preparing to dust, min.* | 30 | 27 |
| Loading rock dust, min.** | 42 | 47 |
| Number of times loading rock dust | 2 | 4 |
| Time spent rock dusting, min. | 213 | 30 |
| Tons of dust applied | .12 | 6.52 |
| Lineal feet dusted | 1,000 | 1,000 |
| Pounds per lineal foot | 12.24 | 13 |
| Pounds per minute dusting | 57.5 | 434.6 |
| Total man-hours per 1,000 lineal feet | 14.25 | 3.46 |
| Tons applied per man-hour | 0.43 | 1.88 |

*Includes loading distributor into shuttle car, attaching cable to power take-off, moving shuttle car to areas to be dusted, and return to reload with rock dust.

**With the Bantam distributor the sacks of rock dust are loaded into the shuttle car. With the Type S. C. distributor the dust is loaded directly into the hopper.

Analysis of time studies to the Type S. C. Airslide rock-dust distributor indicates a need for reducing the time required to fill the hopper. Two men require 50% more time to fill the hopper than one man requires to discharge the load. Bulk handling appears to be a solution to the problem. Time studies also indicate that more than twice as much area can be dusted by two men using the Airslide distributor than three men using the Bantam duster.

## On-Shift Dusting

From our observations it is possible to machine-dust sections of a coal mine, especially one using the split system of face ventilation, during coal-producing shifts without interfering with the face operations. We had an opportunity, recently, to visit a Kentucky coal mine having a seam thickness of 45 in. This is the mine for which the first Airslide rock-dust distributor was designed. At the time of our visit the Type S. C. distributor had been in use for some time and local management was impressed by its performance.

We were informed that their system of face dusting did not include hand application. During the coal-producing shifts a member of the face crew was assigned the task of filling the hopper of the distributor, which is stored in a breakthrough when not in use. To facilitate filling the hopper and loading the distributor into a shuttle car, one end of the rock duster is suspended from the roof by a chain while the opposite end rested on the mine bottom.

When conditions were favorable the foreman would assign one of the two shuttle cars to load the distributor and rock dust certain places which had been worked during that shift or the previous shift. This system maintains rock dusting to within 40 ft of the face with all work performed during the operating shift.

Our experience indicates that the Type S. C. distributor will apply a good coat of rock dust to the roof and sides of an opening. We have been unable to apply as much rock dust on the bottoms as we would desire. However, we believe that this condition will be overcome as we obtain more knowledge from our present experiments.

The introduction of the Airslide distributor is the first big step in modernizing rock dusting in coal mines. The next step is the bulk handling of rock dust from the quarry to the face distributor. Rock dusting is an expensive item in the operation of a coal mine. This cost has been accepted by the industry because of the protection provided by proper rock dusting of the mine surfaces. However, in a competitive industry such as ours, every cost item must be analyzed.

Bulk handling of rock dust and the Airslide distributor appear to have great potential in reducing the cost of rock dusting. Savings in delivery cost on the order of $1.50 to $2 per ton of rock dust, plus the reduction in manpower required to fill the rock-dust distributor from the supply truck and faster distribution to the mine surfaces, will result in a more efficient and economical method of safeguarding our coal mines against explosion hazards.

---

# Air Fluidizing . . .

**G. L. Alston**
Mine Safety Appliances Co.,
Pittsburgh, Pa.

IN THE PAST it was economical to distribute small quantities of rock dust in paper bags to each working place. The dust would be applied by hand or by rock-dust distributor. Today with the mining sections highly concentrated the quantity of dust delivered to each section has become such that it is no longer economical to handle the dust in the paper bags.

Rock dust can be purchased $1.50 to $2 per ton cheaper in bulk than in bags. We also know that as much as 20% of the rock dust taken into the mine is never applied where it will afford any protection because of bag breakage encountered in handling the dust from the outside to the rock dust distributor. The potential savings in lower dust cost, more economical handling of dust and reduce breakage could not be realized until rock-dust distributors could be built with large enough hoppers to handle bulk rock dust, and until a method of transporting the dust in bulk from the mine portal to the rock-dust distributor and transferring it to the distributor could be devised.

Mechanically operated rock dusters of today use the same principle as the first unit in 1925. The hopper sides slope 60 deg and the dust is agitated mechanically so that it will flow down to the discharge mechanism. The 60-deg hopper slope limits considerably the capacity of the hopper but has been necessary to overcome the angle of repose of rock dust. Rock dust, no matter how dry, requires that steep an angle. This, with the limited height of the coal seams, has kept the overall height of rock-dust distributors down to where the maximum hopper capacity of any track-mounted machine we have ever built has been 2,000 lb of dust, with 160 lb for face-area machines.

## Raising Duster Capacity

For the past 2 yr we have been experimenting with large-hopper-capacity distributors and have perfected a system whereby we can cause the dust to flow down a 6-deg slope, compared to the 60-deg slope in present distributors. With this new system we can now build trackmounted distributors with a 20,000-lb hopper capacity, and face area machines with a 4,000-lb capacity. We also are able to bring dust in bulk into the mine in special mine cars and transfer it directly into the face-area distributors at the rate of 1,000 lb per min. With this new system rock dust can now be purchased in bulk and the manual labor of moving sacks of rock dust can be completely eliminated.

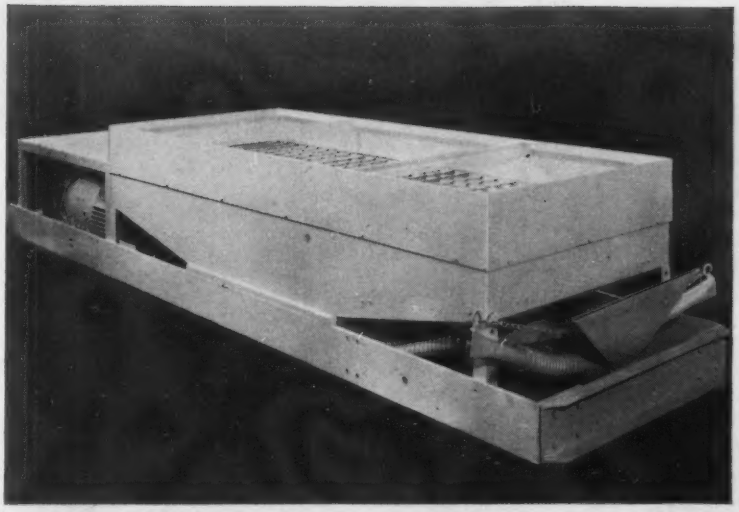
This new system of moving large quantities of rock dust in bulk is an adaptation of a principle recently introduced into the cement industry. The angle of the repose of the rock dust is reduced from 57 deg to 5 deg by fluidization. This is accomplished by introducing air under low pressure through heavy belting with uniform porosity located in the bottom of the hopper under the rock dust. This flow of air fluidizes the rock dust, which then acts almost like water and will readily flow down

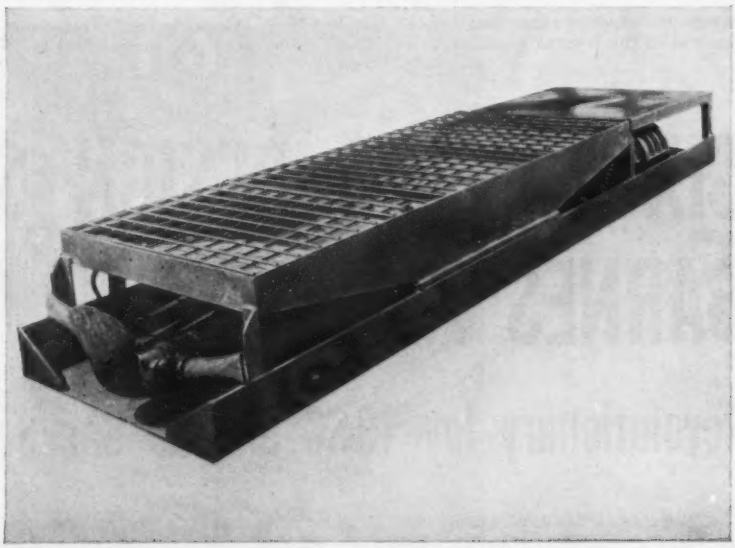
a 6 deg slope, our tests show.

Once we perfected the method of fluidizing the dust and increasing the hopper capacity more than tenfold, it was quite obvious that the next step would be to eliminate bagged rock dust completely and move the dust all the way from the quarry to the rock-dust distributor in bulk.

We have found that the fluidizing principle has other advantages. Some mines have a relatively high humidity and must not take bagged rock dust into the mine ahead of the shift on which it is to be used. Otherwise the dust will absorb so much moisture it will not flow in a conventional distributor. When handling dust in bulk and using the fluidizing principle, the added moisture in no way affects the operation of the distributor. For that matter, it may have some advantage in that the damp rock dust will adhere to ribs and roofs better than dry rock dust. Only when so much moisture has been absorbed by the dust that the discharge mechanism could be fouled, would trouble be encountered.

We are now marketing a face-area rock-dust distributor with a variable hopper capacity from 1,000 to 4,000 lb of dust, depending on the height of coal seam in which it is to be used. The distributor is carried in a shuttle car the same as conventional rock-dust distributors. However, we have been able to increase the dust-discharge rate to 600 lb per min, which is six times greater than any other face-area machine we have manufactured.





**FLUIDIZATION** of the rock dust permits use of a 6-deg angle of repose in design, rather than the normal 60-deg angle required for natural flow. Capacities of various units depend upon height. The above distributor is for use in high coal and the one below is designed for thin seam applications.

## Bulk Handling

Bulk handling the dust from the quarry to the mine and then to the rock-dust distributors is not yet an actuality. We foresee no difficulty. The bulk dust can be brought from the quarry in a railroad car or trailer truck equipped with automatic discharge facilities, and then can be transferred into storage bins, directly into bulk mine cars or down boreholes to mine cars underground. Although not yet the practice we believe that rock dust eventually will be brought from the quarry in open-bed dump trucks, the dust being protected by a tarpaulin, and dumped directly into the bulk supply cars.

Bulk supply cars for carrying the rock dust from the mine portal to the rock-dust distributor can be made the same size as mine cars. We intend to build tanks with a built-in fluidizer that can be mounted directly on existing flat cars at the mines. These tanks will have capacities up to 15 tons of dust, and to empty them only an aeration hose need be attached to fluidize the dust and transfer it into either a track distributor or a face-area distributor.

At the present time only face-area rock-dust distributors with the fluidizing principle are in use. The experience we have gained over the past year has proved that we can apply rock dust with the face-area machine much more economically than with any other rock-dust distributor we have ever manufactured. This experience has also shown the need for eliminating the handling of sacks and moving into a complete bulk-handling system of rock dust throughout the mine. With our experience to date and with what we intend to accomplish within the next few months, we are shooting for a reduction of at least 50% in rock-dust application cost, which should have a direct effect on the cost of coal production.

Bumps and dips are taken in stride by the Joy 18 SC. Car bends with the floor to maintain traction and avoid "roofing." Hydraulic "traction boosters" can be engaged when extra effort is needed on bad bottom or steep grades.

# SIX-WHEELED DESIGN SELECTED AT BARNES AND TUCKER MINE NO. 15

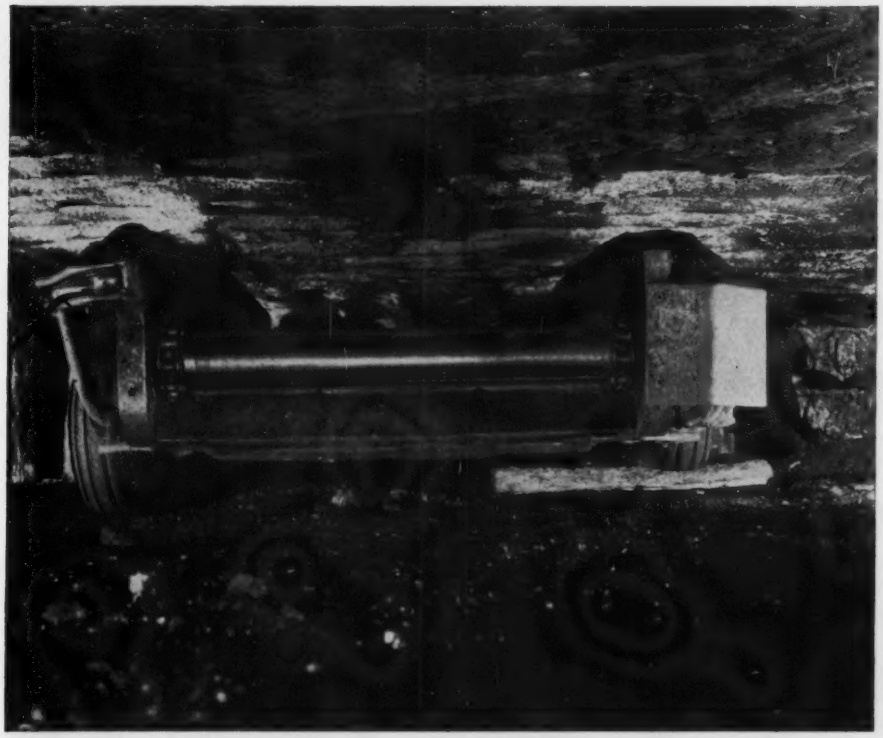
## Revolutionary Joy 18SC Shuttle Car Sets Haulage Records

The value of the hinged-center design in shuttle cars has been thoroughly proven at the No. 15 Mine of Barnes & Tucker Coal Co. Improved trip time and increased capacity enabled Joy 18 SC Shuttle cars to establish haulage records in the mine.

Mine management attributes the outstanding performance to the ease with which the cars can be operated. The 18 SC cars are averaging more trips per shift, because the operators find they can tram at top speed in comfort and safety. Sitting between the wheels, they get a smoother ride, and needn't worry about "roofing." Since the car bends in the middle, it hugs the floor on bumps and dips. This not only prevents damage from striking the roof, but also gives extremely good traction.

Based upon the excellent results at Barnes & Tucker, and other mines, Joy is certain that another pioneering effort has paid off underground. The hinged design has proven that it can increase haulage efficiency in low and medium seams, and is the car of the future in this type of operation. Let your Joy representative give you complete details.

Operator gets better protection riding between wheels on the 18 SC. This, plus easy steering, enables him to tram at top speed all the way.



Straight-through conveyor gives 30-second unloading time for 4 ton loads at Barnes & Tucker No. 15.

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING MACHINERY

JOY

Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario

W. K. DENNISON JR., RMCMI president and superintendent, Kaiser Steel Corp., Raton, N. M.

## The President Speaks . . .

"IT IS EVIDENT THAT THE COAL INDUSTRY in the area served by this organization is in a depressed state at present. The fact that these periods have been encountered and survived in the past is in itself no cause for optimism and probably does little to counteract or dispel the gloom that accompanies them. However, a realistic look at the future potential of the coal industry provides considerable room for optimism.

"The electric utility industry has doubled its capacity approximately every 10 yr and the present rate of growth is greater than ever. Coal supplies more than two-thirds of the fuel consumed by utility steam plants and as the utilities expand coal's proportionate share of this market should increase since the price of oil and gas seem to be continually on the rise. The price of coal at the mine increased less than 1% from 1948 to 1958, a period marked by increasing labor and material costs. This remarkable feat of price control was made possible by the faith of the operators in the industry—faith that was evidenced by tremendous investments in modern mining and preparation equipment that very nearly doubled the average output per man per day.

"At present, the life index of oil and natural gas is measured in terms of less than 25 yr. Our proven coal reserves in the United States amount to nearly a trillion tons, a supply for approximately 2,000 yr at present rate of consumption.

"There are some 200,000 known by-products which can be extracted from coal gases. It is likely that additional uses and new products will be discovered by continued research which is being carried on.

"Research has led to the development of new automatic burning equipment which provides clean, efficient heating and shows promise of increased use of coal for heating in homes, institutions and industrial buildings.

"It has been predicted that the rate of population growth in the west will be more than twice that of the nation as a whole. Increased population means more consumer demand which in turn implies an increase in industrial growth. Any increase in industry will demand a corresponding increase in power, which in turn will require more coal. It is only logical to assume that the coal industry in the Rocky Mountain region will share in any industrial development in this area.

"The coal industry is one which has survived many periods of adversity and, present conditions to the contrary, all indications seem to point to the fact that we are on the threshold of an era of continued healthy growth in the industry—an era which should see coal restored to its proper place of prominence in an industrial nation."

# Rocky Mountain Holds 56th Annual Meeting

Coal's future in the west, selective preparation of coal, mining methods, maintenance of continuous miners and safety are among major themes of convention held at the Hotel Colorado, Glenwood Springs, Colo.

MARKET PROSPECTS in the Rocky Mountain area shared the stage with mining problems, methods and equipment at the annual convention of the Rocky Mountain Coal Mining Institute, Glenwood Springs, Colo., June 26-29. In addition to the three technical sessions, Fred W. Whiteside, secretary and past president, RMCMI, was speaker at the opening session June 27, discussing his 49 yr with the institute and emphasizing the institute's objectives. "The RMCMI had its origin in 1912, when W. F. Murray suggested to Floyd Parsons, editor, *Coal Age*, the formation of the institute. With Mr. Parsons invaluable assistance in helping draw up the constitution and by-laws, it came to pass. The objective of the institute was 'to increase the diffusion of knowledge relating to coal mining, to encourage education in practical and scientific mining, to promote study and research into mining problems, and to advance the mutual interests of its memberships,' I feel that the institute has lived up to that challenge and will continue to do so." Mr. Whiteside was unanimously elected president emeritus of the institute at the opening session.

Emery Olsen, U.S. Steel Corp., Columbia-Geneva Steel Div., Dragerton, Utah was chairman of the Monday afternoon technical session. Lloyd W. Ingles, Colorado Fuel & Iron Corp., Stonewall Colo., was chairman of the Tuesday session and W. K. Dennison Jr., Kaiser Steel Corp., Raton, N.M, was chairman of the Wednesday morning session. Abstracts of the technical papers are as follows:

**The Challenge in Business,** Olin H. Ririe, assistant to the president, Utah Power & Light Co., Salt Lake City, Utah.

"What inflation means to American business is clearly indicated by the number of foreign automobiles that we see in this country. American manufacturers turned their heads for awhile, but I believe they are now looking the situation squarely in the eye. Our hourly automotive labor rate is about $3.25 as compared to 75¢ for the French manufacturers. About 10% of the cars purchased in this country last year were manufactured in other lands. We definitely felt last year the effect of imported steel. What will happen when the three large Indian steel mills go into operation remains to be seen. Much of our nation's machine tool business has been lost to foreign manufacturers."

Mr. Ririe discussed the Tennessee Valley Authority, Bonneville Power Administration, Rural Electrification Administration and the aims of the Socialist party in this country.

**German Brown Coal Mining with**

PRESIDENT-ELECT—A. Z. Dimitroff, electrical engineer, USBM, heads RMCMI in 1961.

OPENING SESSION—Fred W. Whiteside (left), secretary and president emeritus RMCMI; Charles M. Schloss, Schloss & Shubart; W. K. Dennison Jr., Kaiser Steel Corp.; and R. R. Williams Jr., past president, RMCMI, CF&I Corp.

**Bucket Wheel Excavators** (slides and motion picture presentation), L. O. Millard, assistant general sales manager, Link-Belt Co., Chicago, Ill.

Presentation illustrated the need, purpose and arrangement of mining brown coal with the bucket wheel excavator.

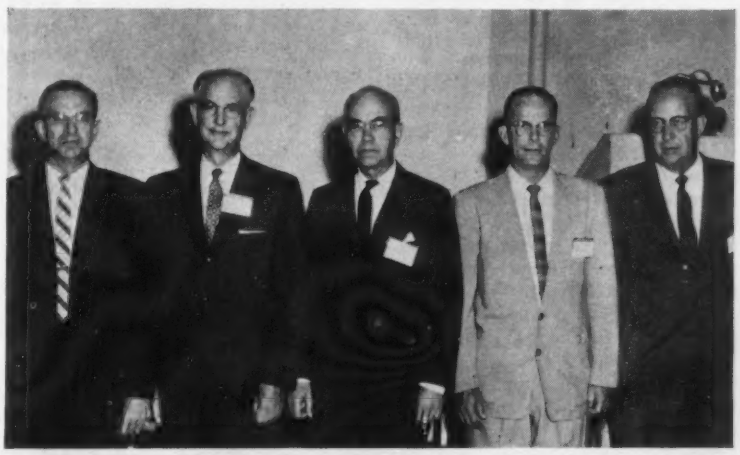
**Koehler Mine Fire,** W. K. Dennison Jr., superintendent, Raton Operation, Kaiser Steel Corp. Raton, N.M.

Events which took place after a fire had been discovered in the Koehler mine of Kaiser Steel Corp. on June 8, 1958 until the fire was brought under control and the mine released from a withdrawal order on August, 1959 by the USBM were described by Mr. Dennison (*Coal Age*, June, 1960, p 134).

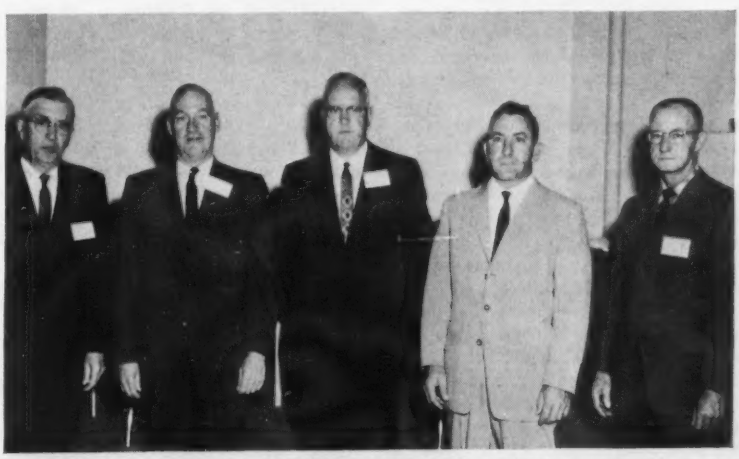
**Full Seam Mining,** Clyde Gibson, general superintendent, Hanna Coal Co., Cadiz, Ohio.

Full-seam mining is a term that does not mean exactly what it says. It has been adapted to mean the practice of shooting down draw slate which lies directly above the coal and loading it with the coal. The seam we are presently mining is the Pittsburgh No. 8. In our area it averages 5 ft in thickness and is fairly level. Directly above the coal is a layer of stone which averages 10 to 14 in in thickness. Immediately above this is a band of extremely high ash material known as "roof coal" or "rooster coal" which is from 3 to 18 in thick. Above this is a conglomerate material varying from 5 to 7 ft. The first really stable material is directly above this.

Entries are driven 14 ft wide. Rooms are worked on 90 deg angles driven on 29-ft centers and 18 to 20 ft wide. Six rooms are worked in a panel which is driven 300 ft deep. A 25-ft solid block of coal is left between panels for protection. As the entries advance all room necks are driven in four cuts. A panel



MINING METHODS, MINE FIRES, CHALLENGE IN BUSINESS—Clyde Gibson (left), Hanna Coal Co.; O. H. Ririe, Utah Power & Light Co.; L. O. Millard, Link-Belt Co.; W. K. Dennison Jr., Kaiser Steel Corp.; and Emery Olsen, session chairman, U. S. Steel Corp., Columbia-Geneva Steel Div.



SAFETY, MAINTENANCE, HYDRAULIC MINING, PREPARATION—Lloyd W. Ingles (left), session chairman, Colorado Fuel & Iron Corp.; George C. Trevorrow, Bituminous Coal Operators' Association; T. Reed Scollon, USBM; Joseph Mason, Mountaineer Coal Co.; and Parke O. Yingst, Colorado School of Mines.

of six rooms is worked on the return entry side. This averages 12 to 13 working places, including breakthroughs. Each crew gets from 22 to 26 places.

The crew consists of nine men as follows:

Two cutting-machine operators.
Loading-machine operator.
Two shuttle-car operators.
Two roof bolters.
Drill operator.
Shotfirer.

Color slides were used to show the various operations at the face.

**Recent Developments for Improving Safety in Underground Coal Mines,** George C. Trevorrow, safety director, Bituminous Coal Operators' Association, Washington, D.C.

There have been many developments since 1937 which have contributed to improved safety records. Roof bolts were introduced into coal mines during this period and have been of tremendous advantage, both in roof control and efficient mining. Fire-resistant conveyor belts and trailing cables have prevented many mine fires. Improved ventilation in face areas, including the use of auxiliary fans, has prevented ignitions and explosions. Wet rock dust provides the means of keeping the working faces protected and thus prevents the propagation of explosions despite much more rapid extraction of coal.

The Federal Coal Mine Safety Act and the Federal Mine Safety Code were formulated and put into effect during this period. The former made mandatory and compliance with the latter becoming a part of the Wage Agreement between signatory coal companies and the UMWA. The inspection service under the Act and Code have been an important part of the safety program, particularly with the growing mutual respect which exists between management, UMWA and the USBM personnel. Safety education has played an important role in the improvement. Aside from safety knowledge imparted to the thousands of miners and supervisors who have taken the Bureau of Mines accident-prevention training, it has been a tremendous factor in improving relations between the workers, their representatives and management.

Mr. Trevorrow gave a progress report on projects in which research is being carried on or those which are being tested under operating conditions. Those discussed have general application for improving safety in all underground coal mines, including dust collecting, foam plug method of controlling mine fires, methane monitoring device, fire-resistant hydraulic fluid, sonic device to evaluate abnormal roof conditions, face shield, and the National Roof-Fall Campaign.

## Rocky Mountain Officers 1960-61

**President**—A. Z. Dimitroff, electrical engineer, USBM, Denver, Colo.

**Vice Presidents** — Colorado—H. B. Lindeman, regional mining supervisor, USGS, Denver; Montana—Clement W. Johnson, Roundup Mining Co., Roundup; New Mexico—Oscar Huber, president, Albuquerque & Cirrellos Coal Co., Madrid; Utah—Douglas H. Hileman, manager, Spring Canyon Coal Co., Royal; Wyoming—Lyman Fearn, Retired chief coal mine inspector of Wyoming, Rock Springs.

**Secretary and President Emeritus**—Fred W. Whiteside, consultant, Denver, Colo.

**Executive Board** (all past presidents) —Fred W. Whiteside; Gilbert C. Davis, Victor-American Fuel Co.; C. M. Shott (retired), Denver; Gomer Reese (retired), Azusa, Cal.; Ronald C. Oliver, Salt Lake City; Fred W. Koelling, Royal, Utah; G. E. Sorensen, Kemmerer Coal Co., Frontier, Wyo.; A. B. Foulger, Lion Coal Corp., Ogden, Utah; H. B. Crandell, Clayton Coal Co., Denver; V. O. Murray, Union Pacific Coal Co.; J. R. Kastler (retired), Raton, N. M.; Arthur Carlson, Knight Ideal Coal Co., Wellington, Utah; Robert L. Hair, Colorado Fuel & Iron Corp., Pueblo, Colo.; John Peperakis, Kaiser Steel Corp., Sunnyside, Utah; R. M. von Storch, U.S. Steel Corp., Columbia-Geneva Steel Div., Dragerton, Utah; R. R. Williams Jr., Colorado Fuel & Iron Corp., Pueblo, Colo.; and W. K. Dennison Jr., Kaiser Steel Corp., Raton, N.M.

---

**Maintenance of Continuous Miners,** Joseph Mason, maintenance superintendent, Mountaineer Coal Co., Fairmont, W. Va.

Mr. Mason discussed the problems and solutions of continuous-miner maintenance. A complete report of his paper appeared in the July, 1960, issue of *Coal Age*.

**Hydraulic Mining of Coal,** motion picture presentation, T. Reed Scollon, chief, Div. of Bituminous Coal, USBM, Washington, D. C.

Film covered the results attained in the first experiments in hydraulic mining of coal near Indiana, Pa. Experiments will be continued.

**The Selective Preparation of Coal,** Parke O. Yingst, project engineer, Colorado School of Mines, Research Foundation, Inc., Golden, Colorado.

At present most coal preparation is aimed at producing a uniform low-ash product. The future will probably see many changes in the specifications for coal for special uses. The future may also require utilization of lower grade coals where only the best are used now. How does selective preparation fit into this picture? Suppose a mine operator has a large market for his coal with a 5% maximum ash limitation. His mine run averages 12.5% ash. He finds that at 5% ash content he only has 50% recovery. The remainder contains 20% ash. He finds he can recover a second product with 10% ash and amounting to an additional 30% recovery. This is acceptable to a less demanding customer at a slightly reduced price. Now the remaining 20 contains 35% ash. He finds he can sell this in limited quantity but at a much lower price to a third customer. By selective preparation he has produced three products and is able to market all of his mine run. Without preparation his mine run was acceptable to only one customer. This example deals with a coal in which the ash is the critical factor. There are other coals with different types of problems, i.e., coking coals and their plasticity, steam coals and their caking properties, by-product coals and their volatile matter content. Remember that each is a case calling for special preparation.

The example previously given may appear somewhat farfetched to some of you at this time. However, the author visited a property in Europe in which the plant produced four products by heavy media, all of which were used. A 1.50 gravity float product with about 6% ash went to the coke ovens, a 1.50 x 1.90 product with 30% to 40% ash was used for power generation. A 1.90 x 2.30 product wih 70% to 80% was gasified and the gas used in both the coke ovens and power plant. The final reject of 2.30 sink material was used as road ballast.

**How to Make Quality Concrete,** (color motion picture), H. A. Cornell, Portland Cement Association, Ft. Collins, Colo.

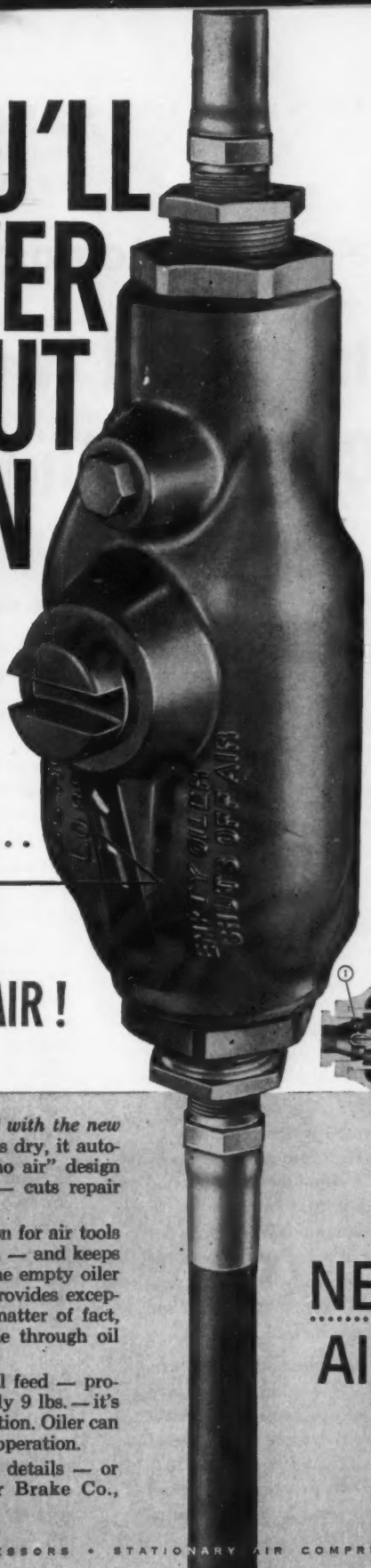
Good concrete is made with cement, sand and gravel. Bad concrete is made with cement, sand and gravel. The difference between good and bad concrete depends on the ratios of the different materials and how they are mixed. The film covered steps necessary to make good concrete.

**A Hunting He Would Go,** (Color motion picture), D. W. Lyke, General Electric Apparatus Service Shop, Denver, Colo.

Film showed how to set up a preventive maintenance program to reduce downtime and maintenance costs.

# YOU'LL NEVER BURN OUT AN AIR TOOL

*with the new Le Roi LO-380 line oiler...*



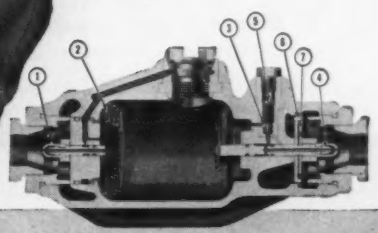

**Here's how the LO-380 Saves Tools— Cuts Repairs!**

(1) Inlet reed valve meters air into the oil-resistant bellows (2) which creates pressure that forces regulated amount of oil through porting connected to the needle valve (3) and the porting connecting it to the outlet reed valve (4) through which oil is injected into the air stream.

(5) Set screw permits easy external adjustment of oil feed during operation.

(6) Positive pressure differential valve assures correct oil feed for all air flows — eliminates oil waste.

(7) Shut-off valve automatically stops air when oiler is empty. As oil supply goes down, bellows (2) expand and contact the shut-off plunger, depressing it until the valve reaches the automatic shut-off position.




## EMPTY OILER SHUTS OFF AIR!

That's right! *You'll never burn out an air tool with the new Le Roi LO-380 on the job!* When the oiler runs dry, it automatically shuts off the air! The "no oil — no air" design prevents unnecessary wear on critical parts — cuts repair bills — extends tool life!

The new line oiler assures positive lubrication for air tools — delivers a steady mist of oil at 10 to 150 psi — and keeps it flowing until you shut the air off, or until the empty oiler shuts it off automatically. Metered oil flow provides exceptional economy, prevents oil splurges. As a matter of fact, the LO-380 will pay for itself in a short time through oil savings alone!

Oiler permits easy external adjustment of oil feed — provides full one-pint capacity. Lightweight—only 9 lbs.—it's easy to use, easy to move—operates in any position. Oiler can be refilled under pressure while air tool is in operation.

Contact your nearest Le Roi distributor for details — or write to Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wisconsin.

## LE ROI NEWMATIC® AIR TOOLS

PORTABLE AND TRACTAIR® AIR COMPRESSORS • STATIONARY AIR COMPRESSORS • AIR TOOLS

AT-906

**Distributed in the Coal Fields by:** Acme Machinery Company, Huntington, West Virginia, and Equipment Service Company, Inc., Birmingham, Alabama.

## Employee Gift Matching

# Another Good Way To Help Our Colleges And Universities

The business community continues to make an impressive record in giving badly needed financial help to our colleges and universities. This year the Council for Financial Aid to Education expects that business contributions to higher education will be well over four times their total of about $40 million a decade ago.

If these contributions, which were about $150 million last year, continue to increase at the present rate, they will hit the target of $500 million set for business aid to our colleges and universities in 1970. This is the amount which, the Council calculates, must come from business if these institutions are to have the money to do their job properly a decade hence.

However, it would be a fine thing both for the nation and the business community if that $500 million dollar target were hit well before 1970. This would put us ahead of a schedule (it is a conservative schedule) in getting on top of what remains one of the nation's most crucial problems—that of having its colleges and universities adequately financed which they are very far from being right now.

**There is, we believe, one quite simple way by which financial support for higher education by business firms might be considerably speeded up. All that is required is that business firms generally abandon the idea that it is possible for every company to have a program to provide such support that is novel and distinctive,** and that this is the only way that interests of prestige and good public relations can be served.

There are nowhere near enough good plans to provide financial help for higher education to equip even a small percentage of our business firms with one that is novel and distinctive. Also **there are a number of very good plans which, so far as we can tell, lose nothing of their value for prestige and good public relations by being used by a large number of companies.**

### The Gift Matching Idea

One plan with these attractive characteristics is the plan by which companies match the gifts of their employees to colleges and universities, and now increasingly gifts to independent secondary schools. So far as we can discover the general plan was invented by the General Electric Company, with what it calls its Corporate Alumnus Program. Now, with variations on the same basic design, almost 100 companies have gift matching plans. We at McGraw-Hill are included in this number.

The gift matching plans vary considerably in detail. Some are limited to alumni of the schools to be benefited. In others any employee can participate by making a gift to an eligible institution. There are also variations in the maximum amounts of gifts by individuals and to individual institutions which will be matched. Some companies have "open end" plans; others limit the total to be matched in any one year. All of the plans, however, embody the same central gift matching idea.

When the plan was first launched some college administrators of little faith in the fundamental generosity of the alumni and friends of their schools expressed the fear that if gifts were to be matched they might be made smaller in the first place. The opposing view was that the possibility of having them matched would stimulate more and larger gifts.

### Advantages Of Gift Matching

**So far as we have been able to discover, the expectation that giving would be stimulated by gift matching has been validated by the experience with the plans.** This has been our experience at McGraw-Hill. Some other important virtues of the gift matching programs have been summarized by

**LEADERS OF SOME OF THE INSTITUTIONS WHICH HAVE SHARED IN THE McGRAW-HILL EMPLOYEE GIFT MATCHING PROGRAM EXPRESS THEIR VIEWS**

*"We particularly appreciate the fact that your grant is unrestricted, and can therefore be used for our area of greatest continuing need — the General Education Fund, from which faculty salaries come."*

W. BOYD ALEXANDER, Vice President and Dean of the Faculty
**Antioch College**

*"We are grateful, not only for the financial support given to The Cooper Union by your company, but also for the stimulus it has provided our alumni in your employ to make annual gifts to their Alma Mater."*

EDWIN S. BURDELL, President
**The Cooper Union**

*"The gift matching program has a dual advantage. First, it acknowledges and repays a debt of honor to those colleges which, often at great loss to themselves, have trained and educated the men who are now among your personnel. This is most fair and equitable. Secondly, by offering to match up to a given limit the contributions of alumni, you encourage support of their own colleges on the part of graduates, who themselves are so indebted."*

President EDWARD B. BUNN, S. J.
**Georgetown University**

*"Thanks to your doubling of the annual gifts of one of our generous and loyal friends who works with you at McGraw-Hill, we are well on the way toward creating what for us will be an extremely helpful scholarship fund. This would not have been possible without the gift matching program."*

C. ADRIAN HEATON, President
**California Baptist Theological Seminary**

Ernest T. Stewart, Executive Director of the American Alumni Council (1785 Massachusetts Avenue, N.W., Washington, D.C.) who would be glad to provide detailed information about them, and the names of companies having such plans. Of the gift matching idea he says,

> *"First*—it assures the corporation that its gifts go direct to those colleges and universities which have furnished it with trained manpower.
>
> *"Second*—it places responsibilities for the gifts on the institutions themselves and drives home the point that they must make a real effort with their own alumni.
>
> *"Third*—it leaves the final decision of corporate support basically to the employees."

For many companies which are fearful of complicating their relations with their customers by courting charges of favoritism if they provide direct financial support for any particular school or group of schools, this latter consideration can be of decisive importance.

The gift matching plan also has what for many companies is the very important virtue of being simply and easily administered. Some additional virtues of the gift matching plan, as seen by officers of institutions which have been beneficiaries, are indicated in the box at the top of this page.

## Effective And Easily Managed

We at McGraw-Hill are well pleased with our gift matching program. It is a broad program in which all employees and a wide array of colleges and universities, both privately and publicly supported, are eligible to participate. We commend it as an effective and easily managed plan to provide urgently needed financial aid to higher education.

**We also urge that business firms adopt this or one of a number of other very good programs of financial aid to higher education* rather than delay in the hope of hitting upon some quite new and distinctive plan. There are very long odds that such delay will prove unavailing. In the meantime our colleges will be losing financial help which it is profoundly in the interest of the business community and the nation to see that they get—and get fast.**

---

*An earlier editorial in this series dealt with tuition supplements as another good way to help our colleges and universities. Reprints of this editorial are available. So are copies of a "more or less socratic dialog," entitled, **A Business Wrestling with the Problem of Aid to Colleges and Universities.** It was prompted by the efforts of McGraw-Hill to find suitable methods of providing financial aid to higher education.

*This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nation-wide developments. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.*

Donald C. McGraw

PRESIDENT

**McGRAW-HILL PUBLISHING COMPANY, INC.**

# Foremen's Forum

## Employee Relations in Perspective

"In the industrial scene of the 1960's, favorable employee attitudes will emerge as a critical factor in management's long term effort . . ."

THE QUOTATION above is from remarks of Howard S. Kaltenborn, vice president—assistant to the president, Westinghouse Electric Corp., before the annual convention of the Edison Electric Institute, Atlantic City, N. J., Jun. 8, 1960. Mr. Kaltenborn stated this conclusion after a thorough analysis of employee relations in America down through the years. His analysis merits the consideration of managers and supervisors in other industries, including ours. Here are excerpts from his Atlantic City talk:

★★★★★★★★★★

Before 1800, the typical industrial organization was composed of an owner, a master craftsman, and a group of journeymen. It was a simple arrangement. If the customer bought a shoddy piece of merchandise, he complained to the owner. The owner complained to the master craftsman, the master craftsman berated the journeyman, and the journeyman went home and kicked his dog or beat his wife.

The introduction of the factory system brought about a great change in conditions. Working groups were larger. There was less personal relationship between owner and employee, and between employee and customer. The introduction of machinery permitted the use of women as operatives, which may or may not have been a blessing. It also brought children into the shops, which was certainly no blessing. The differences in high quality of product became relatively less important.

Today's historians and economists pretty well agree that these early factory days in the United States, when viewed in the framework of their times, were never as bad as their critics have called them. They did, in fact, offer opportunity and a standard of living not previously available to the mass of people. For most of those people, they were good times because they were better than what had gone before, just as they seem like bad times today because they were worse than what followed. This, after all, fits a definition of progress. Nevertheless, the situation of the employee caught up in an industrial revolution was difficult; and throughout the century he attempted to improve his lot by direct action in a dozen different fields.

★★★★★★★★★★

Throughout this period, American workingmen were far more radical than we are inclined to remember today. The radical Populist Party became a powerful force in politics in the 1890's. In 1905, the revolutionary I. W. W. — the Industrial Workers of the World—claimed a million members—and may have had at least 100,000. In 1912, with a far smaller electorate than today, without Woman Suffrage, and against a strong third party, the U. S. Socialist Party polled the largest vote it has ever received in this country—more than 900,000 votes of 15 million cast. The same ratio would give the Socialists almost four million votes in the presidential elections this fall, or enough, probably, to throw the balance of power in favor of either major party.

Throughout the 19th century, the union movement in this country followed a changing course. The American workingman, unlike his European counterpart, looked on his union as a device to help solve his problems, rather than as a valuable institution in itself. Union membership rose and fell in a regularly repeated pattern. On the upswing of the business cycle, a union would be formed and it would flourish by concentrating its efforts on economic problems. When the downswing came, the union would divert its attention from economic matters and begin political activity. Time after time, the mass of employees refused to follow the union into politics and the union disappeared.

In 1893, however, the year after the Homestead Strike, there was a change. For the first time in our industrial history, the trade union movement survived a major recession with its strength and membership substantially intact.

Against this background, we must consider the first constructive management steps to meet new industrial problems. Management was not indifferent to the mounting pressures evident in the rising radical vote, the civil disturbances, and the series of bitter strikes between 1870 and 1900. It was not unconcerned about bad working conditions or about an industrial accident rate that had reached terrible proportions. Beginning in the 1880's management groped experimentally to find effective solutions to strange problems. The fact that many of the approaches now seem naive and ill-advised should not blind us to the good will behind those efforts, or to the actual progress that was made in industrial relations in this period.

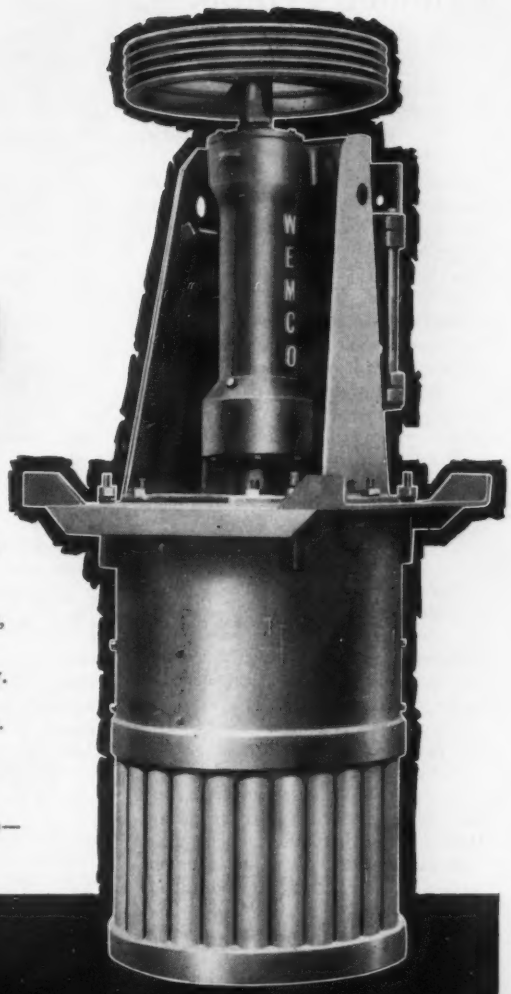
★★★★★★★★★★

George Westinghouse was an enlightened and progressive employer. He established vacations with pay—a thing almost unheard of in the 1880's. He earlier established sickness and accident benefits, student training courses, and incentive plans of work. He recognized the basic principles of collective bargaining; he built some hundreds of low-cost homes for his employees. As early as 1871 he did something that many people predicted would wreck the company. He gave his people Saturday afternoon for a holiday.

★★★★★★★★★★

This happened when industrialists were creating what has been called one of man's greatest inventions—the Amer-

# THIS DECISION WILL PAY BONUS PROFITS OF MORE THAN $6,500 EVERY DAY!




This order and installation of Wemco-Fagergren Flotation Machines by a leading coal producer will result in additional profits of over *$6500 per working day*— and for surprisingly low capital investment. Cost of the total plant addition, including the flotation cells, will be offset in less than four months.

This is another example of how Fags go to work—profitably. Recovery is consistently higher; floor space, maintenance and operating labor, reagent and other requirements are less.

The Wemco-Fagergren record of profit-producing installations tells the story of sound experience. The men of Wemco will be glad to furnish all the facts and discuss why Wemco-Fagergren Flotation will do a better job—where flotation has a place.

WEMCO®

*a division of*
**Western Machinery Company, 650 Fifth St., San Francisco, Calif.**
*and throughout the world*

ican corporation. During this period, management took steps which have had an effect on the course of corporate action to this day.

There was the rise of the scientific management movement. Professional management gradually replaced family ownership. The staff concept in American business evolved. Companies began to use personnel departments. Management interest in employee training grew rapidly. There was a conspicuous growth of management interest in employee-welfare activities. Companies introduced various kinds of employee security plans. Job classification and systematic wage and salary administration began. Finally there was the growth of employee representation plans.

★★★★★★★★★★

The depression of the 1930's caused a decline both in the interest in and practice of good employee relations. As economic conditions worsened, employees and the public lost confidence in business leadership.

To sum up, these were the trends in the period from 1930 to 1947:

1. Employers lost initiative.
2. There was increasing dependence on government rather than on management action within individual companies.
3. Management placed main emphasis on union relations, at the expense of good employee relations.
4. The role of supervisors was restricted.
5. Staff and outside specialists took on an enlarged role.
6. Management fell into an attitude of hopelessness, even of cynicism, in industrial relations matters.

★★★★★★★★★★

Fortunately, we entered a new era of industrial relations—the period from the passage of the Taft-Hartley Act in 1947 to the recession of 1958. In this decade, management rediscovered and again turned its attention to good industrial relations practices. It found that many of its old problems had been solved—or, rather, had simply disappeared. It found that it was burdened with a set of entirely new problems.

In this period, wartime controls were lifted. The erosion of the depression and war was halted. Industry carried out three massive waves of capital expansion and invested unheard-of sums in "the new industry of discovery"—research and development. And management operated against the sharpest price inflation the country has ever experienced in any peacetime period of comparable length.

The symbolic significance of the Taft-Hartley Act was probably more important to management than its actual provisions. For the first time in many years, employers sensed an opportunity once again to do something to meet their problems. In the face of new and compelling circumstances, however, management was unable to achieve the progress in industrial relations that was so urgently required. Because the results achieved fell so far short of the need and the opportunity, this was, in many ways, a frustrating decade for management.

★★★★★★★★★★

The wheel that turned in 1880, that turned again in 1930, and turned again in 1947, has now turned once again. Today we are entering still another era of industrial relations. This will be a period in which management policy decisions will be of vital and lasting consequences to individual companies, to industries, and to the economy as a whole.

★★★★★★★★★★

Management now has the great opportunity to use industrial relations techniques that did not exist before World War I; that were only half developed before 1930; that were forgotten in the 1930's; and that could not be fully used in the 1950's. Management today has an opportunity, unparalleled within the past quarter century, to influence the course of industrial relations along constructive lines. How effectively management seizes this opportunity will decisively determine the general course of industrial relations for years to come.

In the industrial scene of the 1960's, favorable employee attitudes will emerge as a critical factor in management's long term effort to maintain orderly and efficient production processes, to gain teamwork at all levels of the organization, and to insure the continued profitability of the enterprise. In the period ahead, more than ever before, it will take great foresight, ingenuity, patience and careful planning to properly build and conserve the human assets of a company. The skilled execution of such plans must now be considered as a major requirement of successful management.

★★★★★★★★★★

It is often said that the quality of a company's performance can be measured by the length and breadth of the shadow of the men at the top. It is also said that the supervisors and foremen can make or break any industrial relations program. Each of these statements contains an element of truth, but, standing alone, neither is more than a half truth; for the quality of relationships with employees is dependent upon the impact of the total management process, not on the performance of isolated segments of management.

★★★★★★★★★★

We have also come to believe more strongly than ever that the problems facing management cannot be solved by relying on group action or collective bargaining alone. Sound solutions require that the company focus its policy and approach in terms of their impact on employees, individually and collectively. Those employees may be union members, but they seek their opportunities, security and welfare first of all as employees of the company.

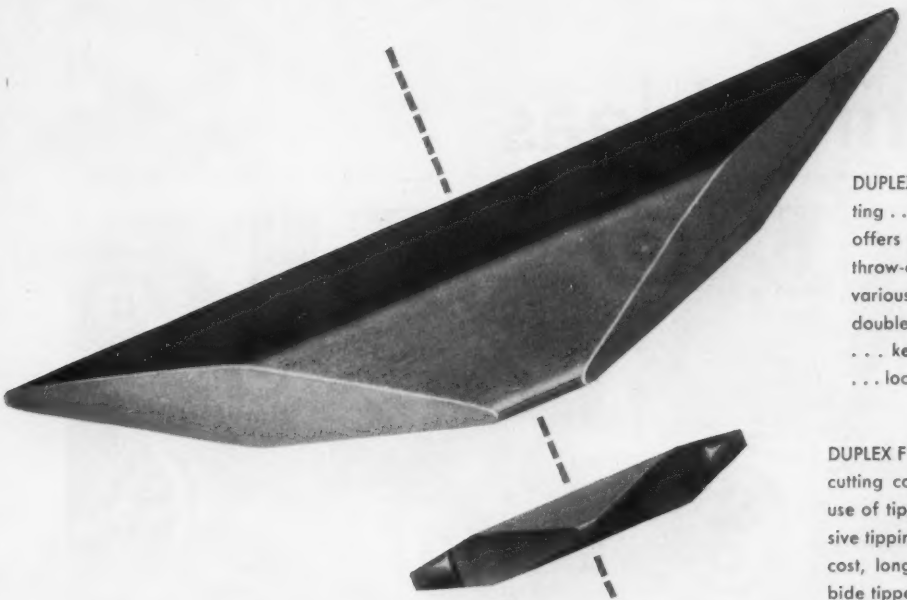
# Half Way Home

THE PITTSBURGH PIRATES have reached the halfway mark in the 1960 baseball season firmly established at the top of the National League. This is the outfit that has been long on potential and equally long on frustration for the past few years.

This year everything clicks. Now—if there is any substance to the baseball postulate that the team in first place on July 4th plays in the World Series—we shall be overjoyed to greet Law, Groat, Friend, Skinner & Co. at Yankee Stadium in October.

Also reaching the halfway mark a few days ago was the 1960 National Campaign to Prevent Injuries from Falls of Roof. The halfway date, Jun. 30, is a milepost in the campaign. It is urged that all enrolees in the campaign submit their accident experience for the first half of the year to the National Safety Council. Forms will be provided by the council, and they should be completed and returned to the council on or before Aug. 15.

It is our hope that the Pirates will continue to dominate, and that the National Campaign against roof-fall injuries will gather momentum and result in a really worthwhile improvement in the safety record.

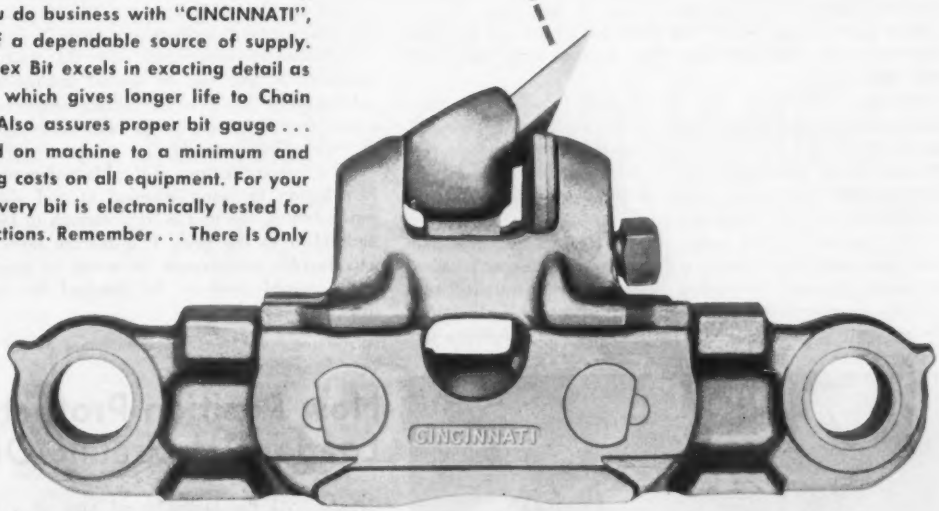


DUPLEX C-11 . . . for all purpose cutting . . . this superior CINCINNATI BIT offers the best obtainable value in throw-away type bits. Available in various grades . . . is reversible and double ended. It has sharp points . . . keen cutting edges . . . long life . . . locks securely . . . easily removed.

DUPLEX F TYPE . . . TIPPED BIT . . . where cutting conditions are applicable to the use of tipped bits . . . Cincinnati's exclusive tipping process makes this the lowest cost, longest life, throw-away type carbide tipped bit available.

# *The* CINCINNATI *DUPLEX BIT*
## *. . . still the finest throw-away type bit available*

**"CINCINNATI" offers the broadest line of precision reversible, double-ended bits for every cutting problem. When you do business with "CINCINNATI", you are assured of a dependable source of supply. The Cincinnati Duplex Bit excels in exacting detail as to size and shape which gives longer life to Chain Block and Holder. Also assures proper bit gauge . . . which reduces load on machine to a minimum and cuts down operating costs on all equipment. For your special protection every bit is electronically tested for size or any imperfections. Remember . . . There Is Only One Duplex Bit.**



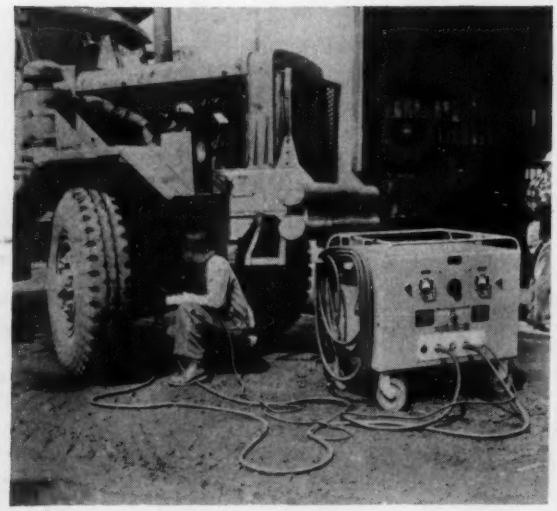

Cincinnati Duplex Bits in conjunction with the Cincinnati Duplex Chains guarantee you the best combination available.

*the*

**CINCINNATI MINE MACHINERY CO.**
CINCINNATI 25, OHIO

**Specialists in cutting equipment for over 35 years**

# Operating Ideas



## Magnetic Testing Aids Maintenance

MAGNETIC TESTING EQUIPMENT is bringing new safety, economy and efficiency to the Enos Coal Mining Co., Oakland City, Ind. Enos maintenance men employ a portable Magnaflux KSH-3D unit to test new equipment and to periodically check parts on other machines while they are in the shop for overhaul or repair.

Chief machinist L. W. King, who has been with the company for about 32 yr, says he believes that the Magnaflux unit paid for itself in the first 6 mo of operation. He and Dexter Davis, a machinist with Enos for 21 yr and principal operator of the machine, agree that it saves time, manpower and materials.

Maintenance officials also report that hundreds of parts have been checked by the magnetic-flux equipment, including gears, shafts, sprockets and truck components. They note that the use of the Magnaflux unit to detect minute flaws in new parts permits their rapid return to suppliers for replacement in keeping with the guarantee.

The system is a big money saver since maintenance men now can spot flaws before a breakdown comes and causes secondary damage. Magnaflux equipment was installed specifically to prevent this costly secondary damage. Furthermore, the company estimates that it costs $14,000 to $16,000 a day when stripping shovels are shut down for major repair jobs.

Zyglo fluorescent penetrant is also extensively used in Enos testing procedure, particularly on the automatic transmissions of the company's big trucks. They are driven to the door of the machine shop and the Magnaflux portable unit is wheeled to them for the check. Zyglo is applied to the aluminum housing around a leaking transmission and subjected to black light.

"This lets us spot the minute cracks," Dexter Davis reports, "where the fluid is leaking out. We can then repair or replace the part without unnecessary delay."

Maintenance supervisors note that the machine is easily operated by any one of several machinists, none of whom needed more than 5 hr of training before using it alone. They report that the machine has been accepted by the workers as another necessary tool.

An important feature of the Magnaflux unit is its portability. In addition to being wheeled in and about the company's repair center, the unit is light enough to be placed in a truck and taken to the field. This feature saves considerable time and enables maintenance personnel to check parts that ordinarily would have to be checked by heating and visual inspection.

Abstracted from *Magnafacts*, published by the Magnaflux Corp.

## New Position Protects Loader's Hydraulic Oil Tank

CHANGING the hydraulic oil tank of a Joy 14-BU loader from its normal position behind the bumper on the side opposite the control levers to a protected position at the gathering head virtually eliminates tank damage at Mathies Coal Co., Finleyville, Pa. In its new position the tank not only is protected but also is close to the hydraulic control valves. Hydraulic hoses are shorter and are in a position where they can easily be replaced.

Lima Type 2400 with 110-ft. boom and 7-cu.-yd. bucket owned by Zacherl Coal Co., Inc., of Oil City, Pa., strips 50 to 70 ft. of overburden, mostly rock, at Williamsburg, Pa.

# We liked it so well we bought another!

"The Lima 2400 is a high-production, low-downtime, top-quality machine. In my opinion, it can do a stripping job better than any other machine on the market today. What more could an operator want!" So says Joseph Zacherl, a partner in the Zacherl Coal Co., Inc., of Oil City, Pa. What's more, he backs up his opinion with action. He bought his first Lima 2400 in 1958 and was so satisfied with it that he bought a second one in June 1959.

What makes him feel this way? His machines work two 10-hour shifts a day, removing about 14,000 yds. of overburden, consisting mostly of rock from 50 to 70 ft. deep. That's really hard digging for any machine. Yet in the first 10 months of use, maintenance costs on the machines totaled less than $500!

But that isn't the only thing that sold this customer. Before he bought his first Lima 2400, he toured the Lima plant. He found out, as you can too, that no shortcuts are taken. Lima builds each part to stand up under heavy punishment and have a wide margin of safety. Lima induction-hardens the principal wear points of its machines, uses anti-friction bearings instead of bushings, makes clutch and brake mechanisms extra heavy for long wear, and adequately powers its machines to do a real high-production job.

These construction details are included in all Lima machines . . . and there's a type and size for every mining need. Draglines variable, shovels to 8 cu. yds., cranes to 140 tons.

Contact your nearby Lima distributor for all the details . . . or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

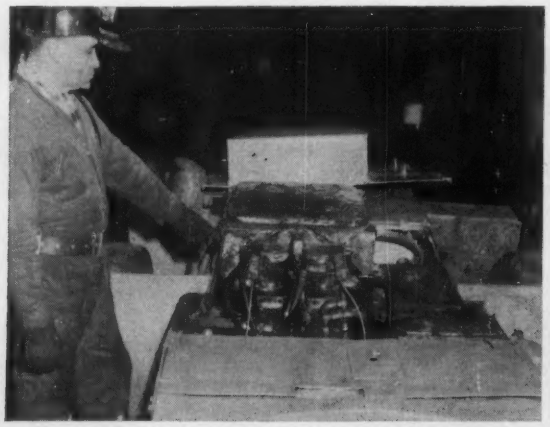
**LIMA** Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

6043

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

BALDWIN BLH LIMA-HAMILTON

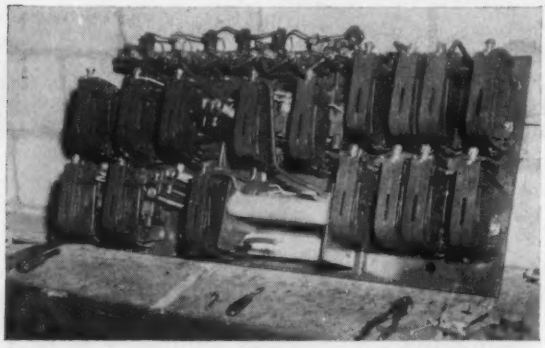


## Cutter Modifications Simplify Maintenance

MODIFICATIONS to Jeffrey 70 UR cutters as they undergo major rebuilds make possible not only faster repairs but also easier machine operation. Since the changes have been made a mechanic saves 3 hr in the time required to change one armature and 1 hr in replacing a hydraulic pump.

The modifications include removing hydraulic control valves from the forward position to a new location between the front and rear wheel and even with the outside of the frame. All hydraulic hoses leading to the controls also were brought into the open where they are accessible for quick changing. This new position also keeps the operator further from the face and away from the swing of the front end of the machine.

By raising the hydraulic pump motor 8 in, the 3-hr and 1-hr savings on armature and pump changeouts were made possible. These two changeouts are now made at Mathies Coal Co., Finleyville, Pa. without removing the cable reel.



## Extra Fuse Protects Motor

AN EXTRA 30-amp fuse installed in shuttle-car panelboards prevents pump-motor burn outs at the Mathies Coal Co., Finleyville, Pa. This extra fuse gives added motor protection in case a speed reducer goes dry and galls. Instead of burning up the motor and causing a costly delay and motor-repair job, a dry reducer merely blows a fuse and alerts the operator to the trouble.

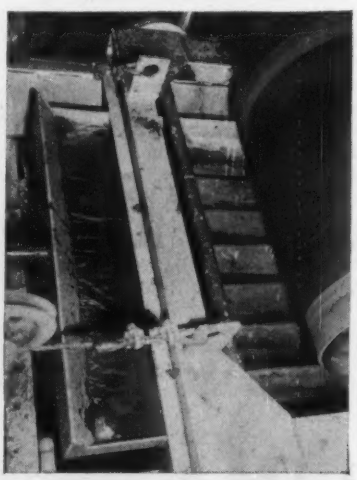
In rebuilding a shuttle-car panelboard, electricians also now put the pump-motor resistor right on the panelboard. Heat from the resistor keeps the panelboard dry and, as a result, there is little trouble from dampness.

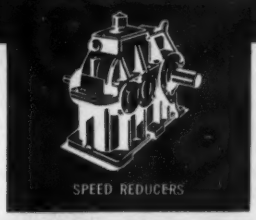
## Dripper Chutes Under Belt Conveyors Simplify Plant Cleanup

DRIPPER CHUTES under belt conveyors simplify plant cleanup by preventing spillage of fines at U. S. Steel's new Maple Creek preparation plant, New Eagle, Pa. These chutes catch fine material that frequently clings to the carrying side of the belt after it passes over the head pulley but drops off on the return run to the tail pulley. Located less than a foot below the return run of the belt, the chutes not only minimize the need for sweeping or washing the floor but also help prevent dust from being thrown into suspension in the air.

To remove any accumulation of fines from the dripper chutes, a worker directs a stream of water into the chute and flushes the material to either a coal or refuse sump. The material then joins the regular plant circuit.

Under the refuse belt and where there is the problem of acid formation, Maple Creek employs stainless steel to build the chutes. The bottom of the chute is saw-toothed in cross section and therefore a minimum of water is needed to flush the drippings down to the sump at the ground level.




SPEED REDUCERS

CONVEYOR BELTING

VIBRATING EQUIPMENT

# Idler questions? H-R has the answers!

At last! A truly comprehensive book on belt conveyor idlers that answers *all* your questions. The new Hewitt-Robins "Belt Conveyor Idlers" book is one of the most complete ever offered to industry. In it you'll find:

- More than 80 helpful graphs, sketches, tables, charts; 150 illustrations; 48 pages of detailed information you can use.
- Comparison of ten competitive idler designs.
- Answers to questions frequently asked about idlers.
- Engineering information on belt speeds, conveyor capacities, idler spacing, and other factors you must consider in selecting idlers.
- Complete explanation of 14 basic types of idlers manufactured by H-R to fit every belt conveyor need.
- Tips on how to extend the life of idlers.

For your copy, consult your H-R representative, or write Hewitt-Robins, Stamford, Connecticut. Ask for Bulletin 8-49.

**HEWITT-ROBINS**

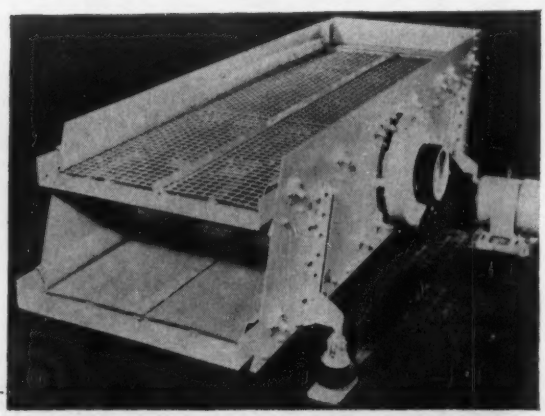
*The name that means everything in bulk materials handling systems...*

CONVEYOR BELTING AND IDLERS • INDUSTRIAL HOSE • VIBRATING FEEDERS, SCREENS & SHAKEOUTS • POWER TRANSMISSION EQUIPMENT

# Equipment Developments

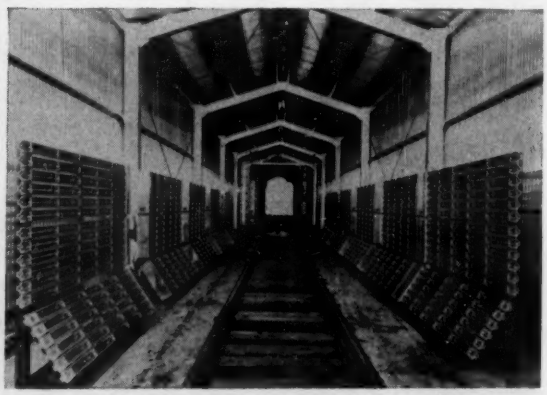
## Ammonium-Nitrate Primer

A new primer-initiator, said to be safer, surer and more economical than high-explosive primers, has been developed by the Propellex Chemical Div., of the Chromalloy Corp., Edwardsville, Ill. Designed specifically for ammonium-nitrate-fuel oil blasting agents, the Saf-T-Boost initiator, Model 151, requires no tying, splicing or taping and is suitable for decking, stemming or any other blasting technique. Economical to use, according to the company, the primer, plus 29 lb of ammonium-nitrate-oil mixture, can replace a 30-lb dynamite primer for less than half the cost, with equal or better results. In addition to being cheaper and safer than other primers, the Saf-T-Boost initiator is said not to be troubled by hypersensitivity at freezing temperatures. Packaged in a cardboard container, the new primer weighs only 13 oz and is 3 in in diameter by 2 in high. Two ¼-in holes through the primer permit quick and easy threading of the initiating cord. Fifty-grain detonating fuse is the most commonly used, though other types may be employed for special purposes. The primer detonates the blasting mixture as well or even better than high-explosive primers. Though small, the Model 151 delivers a detonation velocity of over 20,000 fps.



## Vibrating Screens

W. S. Tyler Co., 3615 Superior Ave., Cleveland 14, has a new line of vibrating screens. Called "Ty-Rocket," the screens come without a base and have modular design so that different sizes can be assembled from standard components. Result, says the firm, is lower initial cost without compromising strength and quality standards. The screens are vibrated by an off-balance shaft, supported in two bearings, which imparts a high-speed, circle-throw motion to the screening surface. A unique feature—four universal brackets mounted on the side of the frame—permits simple attachment of either supporting feet with spring mounts or overhead cables with spring mounts for suspension mounting. The new line will be available in a range of standard sizes from 3x6 ft to 6x16 ft, two or three decks.



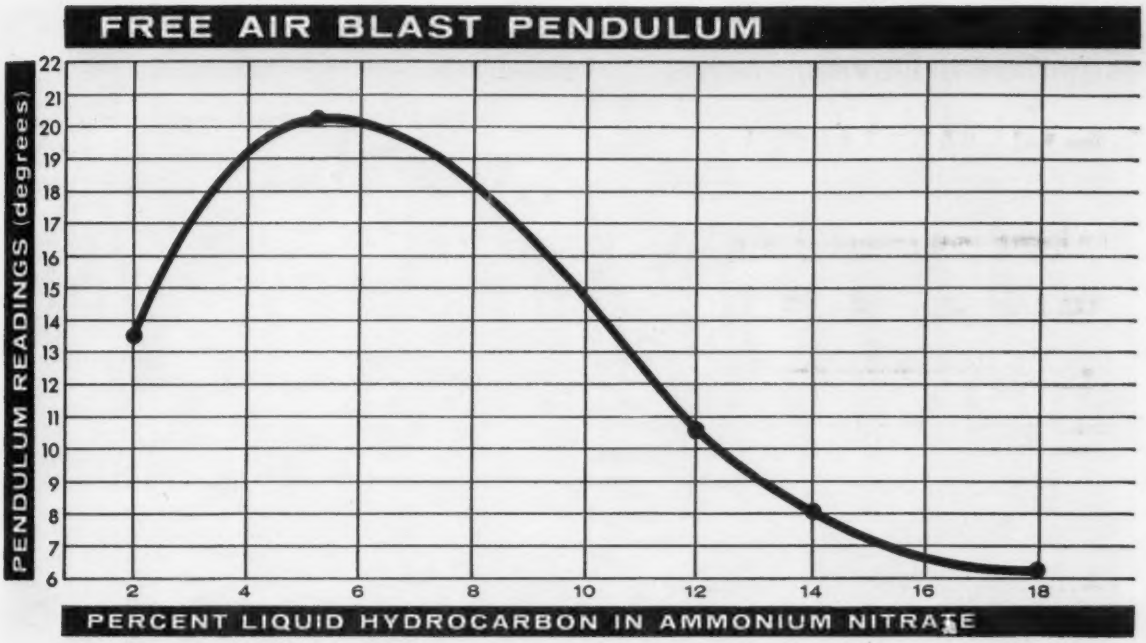
## Prefabricated Car Thawer

Low cost and flexibility are major claims for the Thaw/Master infrared-principle railroad car thawer, sold by Thaw/Master, P. O. Box 4812, Washington 8, D. C. In its simplest form, for one car, the installation can consist of three panels on each side of a car, or six panels underneath, which can thaw a frozen car in approximately 1 hr. For fast, heavy-duty thawing at around 5 min per car, both side and underneath panels can be employed, as shown in the accompanying illustration.

Operating on 440- to 480-V 60-cycle 3-phase AC, the thawer uses resistance-type alloy-sheathed heating rods encased in heavy-duty alloy extrusion and assembled in standard-sized panels. Units are delivered completely assembled, with wiring and controls ready for connection to the local power supply.

## Blasting Agent

Du Pont Co., Wilmington 98, Del., is marketing a new low-cost pre-mixed blasting agent said to be extremely efficient. Called "Nilite 101," this nitro-carbo-nitrate agent can be used in holes as small as 2 in in diameter and comes in 50-lb bags. Citing advantages over the combination of ammonium nitrate prills and fuel oil mixed in the field, the firm notes that Nilite 101 is free-flowing and provides greater assurance of uniformity in blasting. The result is a saving in time, increased production efficiency and reduced maintenance costs. The material, which is not cap sensitive and requires a primer to detonate it, also improves performance of delay blasting systems, according to Du Pont.




**As this graph shows,** blast output is closely related to the amount of fuel oil absorbed by the solid material. If it is too dense, too little fuel oil is absorbed and optimum blast energy cannot be released. Spencer N-IV has a special structure which allows it to absorb fuel oil more evenly and completely and release greater blast energy.

# Why Spencer N-IV And Fuel Oil Deliver Greater Blast Output Than Higher Density Materials:

## Because it soaks up fuel oil better, Spencer N-IV gives more blast energy than higher density, non-absorbent material

Do higher density materials really produce more blast energy? No, say blasting experts.

Actually, the opposite is true. When higher density material is used, the net result is really lower blast output. According to *Military Explosive*, published by the Department of the Army:

> **"The sensitivity of ammonium nitrate to initiation decreases with increase in loading density. If the density exceeds 0.9 charges of 1 to 3 pounds cannot be detonated completely by large booster charges, and larger quantities cannot be detonated completely at densities greater than 1.1."**

The reasons for this are clear. When a higher density, non-absorbent material is used, the outer layer of the particle is coated with too much fuel oil. This retards the efficiency of the explosion when the blast begins.

In addition, the inner layers of the higher density material don't get enough fuel oil. The mixture is too lean so that maximum blast energy cannot be released.

According to extensive research investigations, Spencer N-IV, when mixed with the recommended 6% fuel oil, delivers 20% to 25% more blast energy than equal charges of other solid ammonium nitrate-fuel oil mixtures. There are two main reasons for this:

**1. Lower density which provides greater ease of detonation.**

**2. Special prill structure which allows fuel oil to be absorbed more evenly.**

Many other prilled ammonium nitrates have coatings of diatomaceous earth. This coating tends to absorb more fuel oil on the outside of the particle. It reduces the distribution of oil within the particle.

Because Spencer N-IV has no diatomaceous earth coating, fuel oil can penetrate it more evenly. This results in a better fuel balance and much higher blast efficiency.

SPENCER®

Spencer Chemical Company
401 Dwight Building
Kansas City 5, Missouri

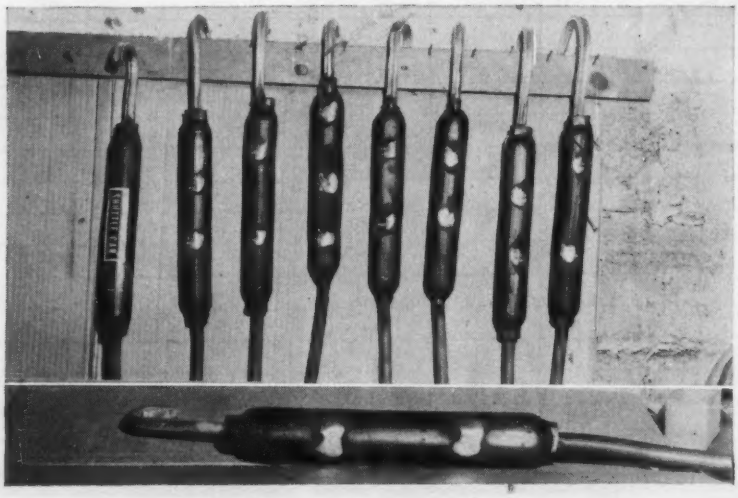
Please send me full details on Spencer N-IV as an ingredient in blasting.

Name_____

Firm_____

Address_____

City_____ State_____



## New Design in Fused Nips

A new vulcanized trolley fused nip, made by Ward's Cable Vulcanizing & Fuse Nip Service, 630 Elm St., Huntington, W. Va., has, per the manufacturer, the following advantages:

1. Fewer electrical hazards.
2. Permanently sealed electrical connections.
3. Absence of loose connections (eliminates heating).
4. Waterproof and shockproof.
5. Permanent ampere rating (cannot be changed).
6. Metal identification tags for stamping pertinent information, such as ampere rating, number and type of machine attached to, and section and mine number. Other information can be added on request.

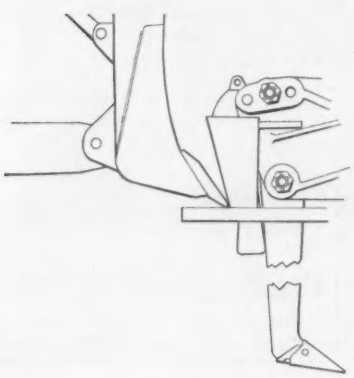
Material for making the nips consists of factory-rated fusestrips, fiber insulating strips, connectors, No. 6 section wire, 2-ft lengths of cable and raw rubber.

One end of the No. 6 wire forms a hook to provide a means to attach the nip to the power source. The other end is flattened so that a hole can be drilled in it to connect one end of the fuse strip. The fuse strip is protected by two strips of fiber, one on each side. The fuse and fiber strips are then connected to the No. 6 wire and the 2-ft length of cable.

This assembly is placed in a special vulcanizing mold with raw rubber to form the outside cover. Identification tags are molded into the cover during the curing period.

## Tractor-Scraper

New from LeTourneau-Westinghouse Co., Peoria, Ill., is a large-capacity tractor-scraper, which the company is producing jointly with Hancock Mfg. Co., Lubbock, Tex. Hancock makes the scraper, a 10-cu yd model, designed for jobs where self-loading is mandatory. This Model 10E2 scraper has an exclusive "chopping action," which permits it to load quickly under moderately difficult conditions, report the firms. The chopping action is provided by the slat-type elevator, which, driven by a LeTourneau-Westinghouse motor, chops and pulverizes the material and carries it off the scraper blade high into the bowl. The actions makes spreading easy and uniform and eliminates the need for a separate finishing tool, it is noted.



## New Push Block

A one-piece tandem ripping push block that transmits force of the push tractor directly to the ripper shank and thereby minimizes bending forces on the shank has been announced by Caterpillar Tractor Co., Peoria, Ill., for both the No. 8 and No. 9 Rippers. The push block is mounted on the rear of the five-position clevis equipped with a straight shank. It is pinned at the top through the rear clevis pin hole, and requires neither welding nor cutting for installation. In operation, the blade of the second tractor is placed in the "V" formed at the junction of the vertical block and a horizontal plate. The block extends below the plate and contacts the rear of the ripper shank at a point nearly at ground level. By keeping the point of contact so low to the ground and by eliminating the transmission of pushing force through the clevis, pins and beam, the ripper shank is subjected to much less bending force. The push block also is of aid in single tractor ripping work since the 1,350 pound weight helps hold the shank in the ground.

# How far will a Yieldable Set yield?

In any discussion of the Yieldable Arch or Ring, the question is invariably asked: How far will the Arch yield? Answer: It is not unusual to have a Yieldable Arch set yield until the legs almost touch each other at the center.

### *Gives Ground Chance to Settle*

That's the whole point of the Yieldable Arch; it is *normal* for the joints to yield. It's the old technique of letting the enemy beat himself. By gradually "giving" under excessive pressures, the Arch gives the overburden a chance to settle into a natural arch of its own, and thus bring forces into equilibrium. As soon as stability is reached, the Yieldable Arch holds the line. A set of Arches consists of curved, U-shaped sections nested together and overlapped enough to permit clamping with two U-bolt clamps at each joint. The clamps control the degree of tightness, and permit yielding when the forces exceed the load for which the joint was intended. Each Yieldable Arch set is tied to adjoining sets by means of horizontal struts, which add lateral rigidity to the structure.

### *Usually Pays for Itself in a Year*

Besides increasing mine safety, the Yieldable Arch offers high salvageability, and usually pays for itself within its first year of service. A Bethlehem engineer would like to discuss the application of the Arch to your roof problems.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
*Export Distributor:* Bethlehem Steel Export Corporation

**BETHLEHEM STEEL**

Get DOUBLE EXPANSION
for
DEPENDABLE roof support
with
PATTIN
roof bolts and
expansion shells

STYLE D-1

The unique double expansion feature of all Pattin expansion shells insures *dependable* roof support, in hard or soft roof conditions. Their double holding power guards against failure — even under a 20 ton pull!

Pattin features include a parallel contact with the hole, and no definite drilling depth is required, as the shell can be securely anchored at any place in the hole. They anchor solidly and will not turn while being tightened. Wedge and shell are assembled in a manner to prevent loss of parts in handling, and the bolt and shell assembly are furnished as a complete unit. Plates are bundled separately. No special nuts or ears are required on the bolts. These features make a safer roof — and a safer roof means fewer accidents, increased production, more clearance for equipment operation and better ventilation.

Pattin specializes in roof bolting —it's our business, not just a sideline! Your business is important to us, and our service engineers are always available for consultation on your roof problems—ready to give you service when you need it! WRITE OR PHONE US TODAY for complete details.

Reg., U.S. and foreign Pat. Offices

IN WESTERN STATES

Pattin expansion shells are available and serviced exclusively by Colorado Fuel and Iron Corporation, Denver, Colorado. Western mining companies should contact them direct for information and consultation.

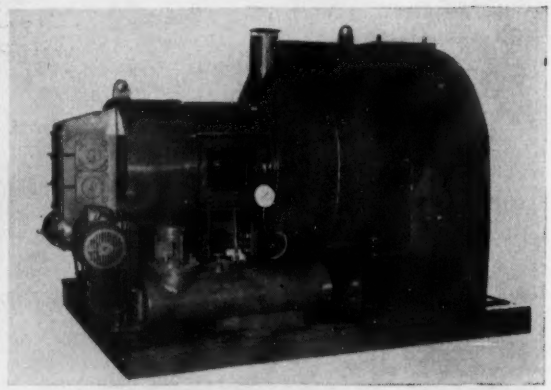
The PATTIN split-type BOLT

The split-type bolt is one of the first slotted bolts, and continues to be a favorite wherever split-type bolts are used. Many mines still prefer this type. The bolt is a full 1-inch in diameter, with cut threads and furnished with hex or square nuts and various size plates and wedges.

PATTIN
MANUFACTURING COMPANY
MARIETTA, OHIO

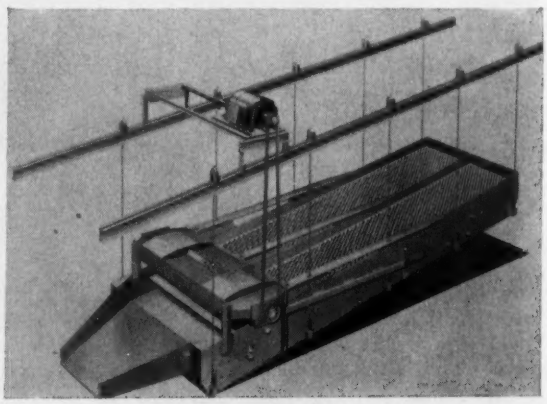
The PIONEER of roof bolting . . . established 1888



## Dewatering Coal

Wemco Div., of the Western Machinery Co., San Francisco, has been granted exclusive North American manufacturing and sales rights for the Sibtechnik vibratory centrifuge, originally developed and tested in Germany. For separating liquids from solids such as washed coal, the horizontally-mounted vibratory screening centrifuge uses a truncated cone-shaped screen whirled at high speeds to achieve separation. Solids to be dewatered are introduced through a revolving feeder head, in which they are gradually accelerated and directionalized so that they are placed on the revolving screen at its smallest diameter with minimum impact. Solids are retained on the screen while liquid is effectively removed through the screen by centrifugal force. The unit is so mounted on leaf springs that vibration is isolated from the base.



## New Shaker Screen

Compact design and increased capacity highlight a new shaker screen made by Fairmont Machinery Co., Fairmont, W. Va. Fairmont has integrated the drive in this screen to eliminate cumbersome drive arms and provide extra space for screen capacity. With the drive and screen suspended from wire rope, reciprocating forces are not transferred to the structure. Drive mechanism is an enclosed self-contained unit with forced lubrication and all anti-friction bearings. Units are furnished with the desired stroke and speed ranging from ½ in at 1,000 rpm to 5 in at 165 rpm. Speed and stroke can be adjusted and varied. Power is supplied by a 3-phase induction motor. The screen is equipped with channel gates which direct the flow of the graded materials from each deck.

# Where heavyweights move job records prove...

# FIRESTONE TIRES KEEP BIG WHEELS TURNING!

Look to Firestone to help keep big wheels turning—to keep the cycle going and the project moving smoothly toward your finish date! That's because Firestone off-the-highway tires have built-in toughness to take rugged abuse and reduce your downtime. Shock-Fortified nylon cord, for example, guards against impact damage. And Firestone Rubber-X, the longest-wearing rubber ever used in Firestone off-the-highway tires, provides a big payoff in extra service hours. Investigate Firestone's Giant Tire Service for tires and maintenance matched to every need of every project on your docket. Call your Firestone Dealer or Store. Or write: Manager, Off-The-Highway Tires, The Firestone Tire & Rubber Co., Akron, Ohio.

**ALWAYS SPECIFY FIRESTONE TIRES WHEN ORDERING NEW EQUIPMENT**

Super Rock Grip Wide Base* Super Rock Grip Deep Tread*

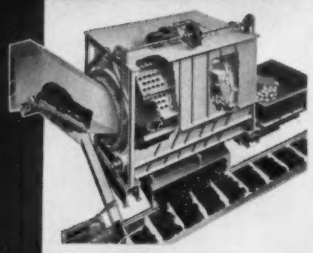
**TUBELESS OR TUBED**

**Firestone**

***BETTER RUBBER FROM START TO FINISH***

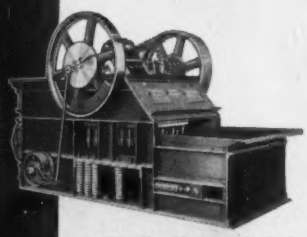
Copyright 1960, The Firestone Tire & Rubber Co.
*Firestone T.M.

America's most complete line of CRUSHING EQUIPMENT



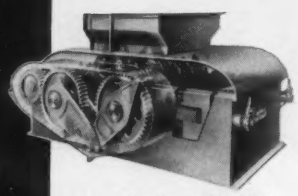
McNally Pittsburg Rotary Breaker

This unit allows positive control of top size in handling run-of-mine washery feed. Production of fines is held to a minimum.



McNally Norton Vertical Pick Breaker

50% Less fines when reducing lump to egg and stove sizes.

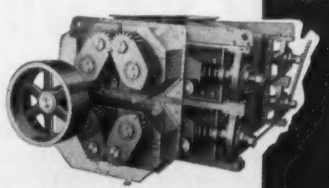


McNally Double Roll Gearmatic ROM Breaker

Built in tonnage ranges from 750 tph to 1400 tph. Full floating gearmatic drive.

McNally Gearmatic Stoker Coal Crusher

This unit offers three prime advantages: high volume production, plus accurate sizing, plus low percentage of fines.



McNally Two Stage Crusher

This unit consists of a double roll primary crusher mounted above a double roll secondary crusher—compactly arranged into a single rigid structure.

Available From Stock and on Short Delivery
For immediate action on complete information write, wire, or call

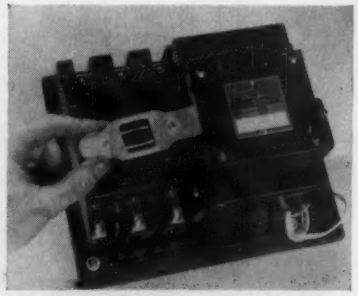
McNALLY PITTSBURG MFG. CORP.

Pittsburg, Kansas Wellston, Ohio

Equipment News *(Continued)*

# Fire-Resistant Hydraulic Fluid

Hulburt Oil & Grease Co., Trenton and Castor Aves., Philadelphia 34, Pa., for 99 yr a pioneer and leader in developing new lubrication procedures and products for the coal industry, announces the introduction of the company's new fire-resistant-type hydraulic fluid. The new fluid, recently tested and approved by the Bureau of Mines, is a water-in-oil emulsion that will eliminate fire-hazard conditions at the face. The new product culminates an extensive Hulburt Research program.



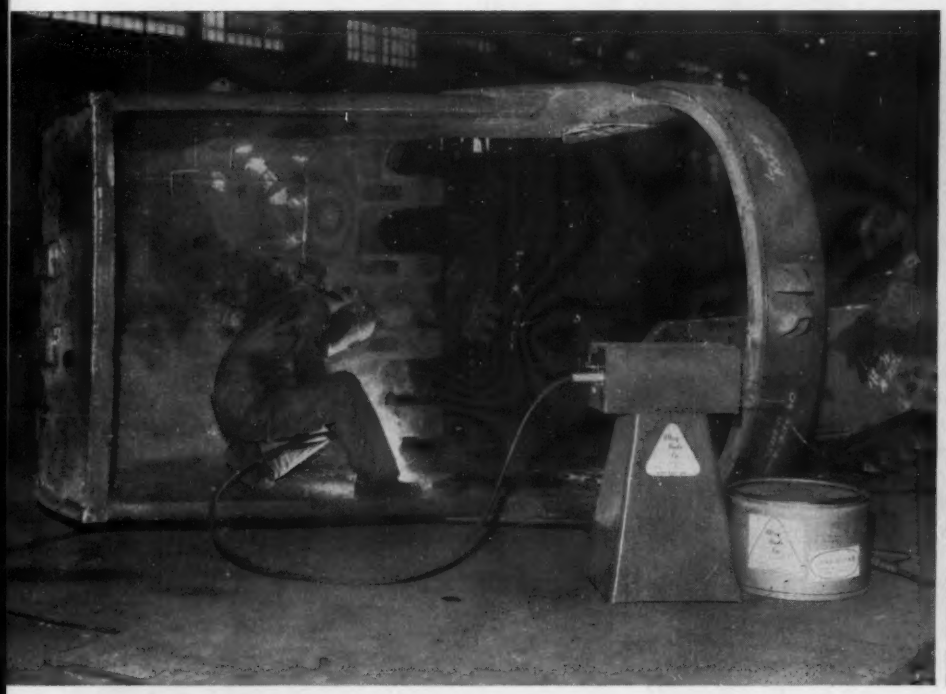
**BREAKER CONTROL**—A line of electrical operators permitting Type AB circuit breakers to be remotely controlled is new from Westinghouse Electric Corp., Pittsburgh. You can get models with rated control voltages of 120, 240, 480 or 600 V, AC and 125 V, DC. These units will actuate breakers rated to 100 amps at 600 V in frame sizes E, EH and F. The operators may be used for many remote-control applications involving equipment such as engine generators, battery chargers, pumps and lighting.

**CLOTHING STORAGE** – The Moore Co., 1036 Quarrier St., Charleston, W. Va., offers this new concept in overhead clothing storage, featuring both self-locking garment hooks and the patented Sur-Hold coat hanger with vertical coat stabilizers. This "Lockerbasket" provides secure sanitary ventilated overhead storage of clothing and personal effects. The design of the hanger prevents garments from slipping when the unit is in the elevated position, and Moore's heat-treated and galvanized operating accessories provide safe, easy elevation of loading clothes storage units into normally wasted ceiling areas, it is noted.

**HOSES**—Vastly improved flexibility is the key feature of two new hose products announced by The Goodyear Tire & Rubber Co., Akron 16, Ohio. "Flexwing" and "Flexwing" water-suction hose, are said to provide 30% more flexibility than previous woven-wire types. Specially-placed spiral wire and textile braid assure ease of handling and safety in the new product. Designed for short-range transfer of petroleum products, the truck hose is made from oil-resistant stock.

**TRUCK PERFORMANCE**—A new slide rule that measures truck performance in a few seconds has been developed by The White Motor Co., Cleveland 1. The instrument, built for White by Perry-graf Corp. of Los Angeles, determines: what horsepower is needed for desired performance, including air resistance and road surface, for a specific gross weight; how steep a grade and at what speed a specific vehicle may climb; what road speed is best for an engine; how fast the vehicle may go, based on tire size, engine speed and total gear ratio; and what axle ratio is required to attain this maximum speed.

# *NEW WEAR-O-MATIC WH Produces High Strength Manganese Attachment Welds Equal to 308 Stainless For PAGE ENGINEERING COMPANY*



The Page Engineering Co. was founded in 1903 by Mr. John W. Page who originated the dragline method of digging. Today Page Engineering is the nation's leading manufacturer of dragline buckets, walking draglines and other equipment used in dragline operations.

High strength properties and crack free deposits are the two major requirements for welding alloys used to attach manganese parts to PAGE AUTOMATIC BUCKETS made of high strength alloy steel. Until recently, only type 308 stainless manual electrodes satisfactorily met both requirements. Other alloys have been tested from time to time but failed one or both tests leaving Page no choice but to continue using 308 stainless electrodes for critical joints.

Now, new Wear-O-Matic WH semi-automatic wire developed by Alloy Rods Company fills both the requirements by producing high strength properties identical to those of 308 stainless electrodes while depositing absolutely crack-free weld metal. The Page Engineering Co. has replaced most 308 stainless welding in their dragline bucket production with new Wear-O-Matic WH alloy, gaining the economies of semi-automatic open arc welding and retaining the same high strength requirements for manganese attachment welding. Page engineers report Wear-O-Matic WH gives them the additional advantages of faster deposition and smoother arc characteristics—better than any semi-automatic wire they have ever used in the production fabrication of dragline buckets.

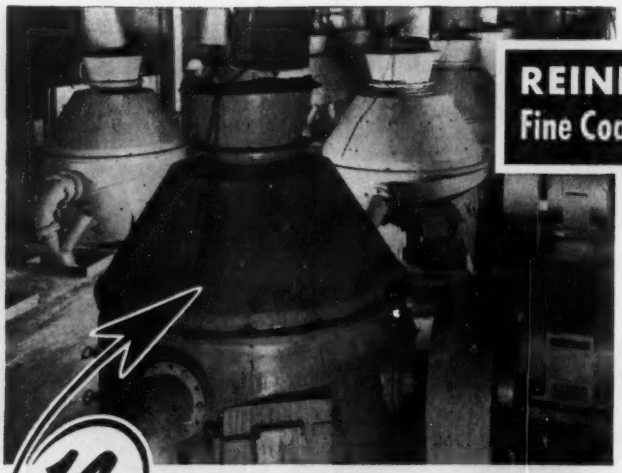
You too, can benefit from the experiences of Page Engineering. For any application involving the high strength attachment welding of manganese, whether it be production fabrication of manganese parts or field maintenance, Wear-O-Matic WH will do the job better than any alloy you are now using and do it semi-automatically. Contact your Alloy Rods Company distributor or Hard Surfacing Specialist for specific application information. Or write direct to Alloy Rods Company, P. O. Box 1828, York 14, Pennsylvania.

## ALLOY RODS COMPANY

**YORK, PENNSYLVANIA**

SALES OFFICES AND WAREHOUSES • NEWARK, PITTSBURGH, PHILADELPHIA, BOSTON, CHICAGO, SAN FRANCISCO, EL SEGUNDO, CALIFORNIA — DISTRIBUTORS IN ALL OTHER PRINCIPAL CITIES

**TWENTY YEARS OF LEADERSHIP IN THE DEVELOPMENT OF QUALITY ALLOY ARC WELDING ELECTRODES**




14

**Fourteen Reineveld Fine Coal Dryers operate at Clinchfield Coal Company's new Preparation Plant Moss #3.**

This demanding producer of quality coal is highly satisfied with the performance of his battery of Reineveld as they give him high capacities, consistently high rate of water removal and very low operating and maintenance costs.

For your drying needs select the Reineveld—its performance is uniformly good.

**HEYL & PATTERSON, inc.**

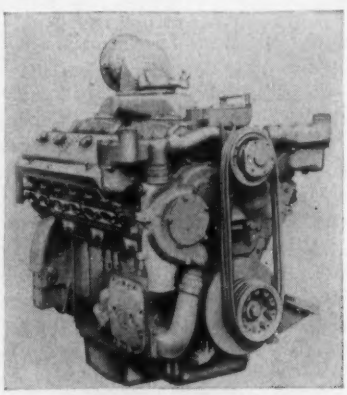
55 FORT PITT BLVD., PITTSBURGH 22, PA.

H&P

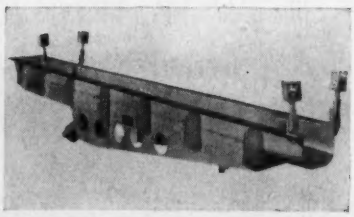
LESCHEN WIRE PORTER ROPE DIVISION

H. K. PORTER COMPANY, INC.

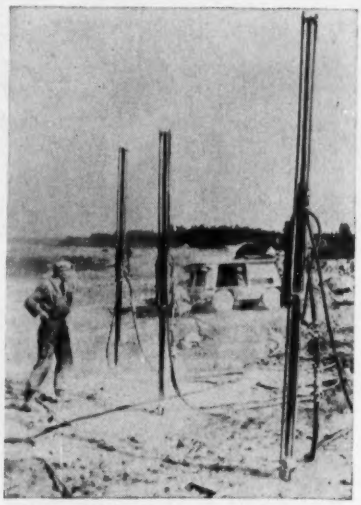

## Equipment News (*Continued*)



**NEW DIESEL**—The diesel engine shown above is a proper photo of the new 430-hp V-12 now included as part of the standard line of LeTourneau-Westinghouse Co., Peoria, Ill. The unit was incorrectly pictured on p 164 of the June issue of Coal Age. Used in the firm's 29-yd Model B Tournapull, the new engine offers an increase of 28% in horsepower over standard "in-line" engines formerly employed. Acceleration time is substantially reduced as the machine comes out of the cut and gets up to haul speed, the company reports.



**COAL CONVEYOR**—Here is a new vibrating conveyor for bulk movement of coal. Made entirely from iron and steel by The Cleveland Vibrator Co., 2828 Clinton Ave., Cleveland 14, the deep-tray conveyor handles any size coal from 3-in egg to ⅜-in slack. The machines may be either hung with shielded suspension springs (photo), or floor-spring mounted isolating the vibration from the supports. Simple and lightweight, the conveyors cost less than conventional conveying devices, says the firm. The only moving part is an air piston and action is firm but gentle so as not to shatter coal.



**DRILLING**—This self-standing air-operated "Bencher," made by Atlas Copco, 545 5th Ave., New York 17, is designed to fill the gap between hand-held rock drills and larger wagon drills. The BMP 31 is for use on small-scale projects or in work areas where it either would be difficult or uneconomical to move in wagon drills. It can be used for shaft-sinking in addition to its regular benching functions. The firm says it drills faster and at lower cost than hand-held machines and that two units can be run simultaneously by a single worker. Primarily designed to handle 5-ft steel changes, the benchers mount heavy-duty, high-capacity Atlas Copco rock drills such as the "Lion."

**TUBE-COOLED MOTORS**—The Louis Allis Co., Milwaukee 1, has available

Quaker Thermoid

# "COLEDGE" BELTING

# REDUCES EDGE WEAR, ADDS MILES OF USE!

Improper training can ruin a conveyor belt faster than any other abuse. Riding up and rubbing against a frame member soon wears away the stiff edge of conventional belting and exposes the carcass plys to moisture, mildew, dirt and eventual ply separation. "Coledge" belt construction was developed by Thermoid Division—to overcome this weakness and extend belt life.

"Coledge" construction puts plenty of extra rubber on the edges where it counts most . . . the plys are stepped back to make a more flexible edge that rides with the punches when misalignment occurs. This "Coledge" construction can put many extra miles on your system, especially in coal fields and sand and gravel pits where most belt failures are the result of excessive edge wear. Exclusive with Thermoid Division, "Coledge" construction is available in any standard type belt your application may require.

So, if you have an edge-wear problem with conveyor belts, specify "Coledge" construction. See your Thermoid Division industrial distributor for technical data or assistance, or write *Thermoid Division, H. K. Porter Company, Inc., 200 Whitehead Road, Trenton 6, New Jersey.*

**THERMOID DIVISION** PORTER **H. K. PORTER COMPANY, INC.**

**PORTER SERVES INDUSTRY** with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

# WHICH JOB WOULD YOU TAKE?

If you're like most of us, you'd take the job with the more tempting salary and the brighter future.

Many college teachers are faced with this kind of decision year after year. In fact, many of them are virtually bombarded with tempting offers from business and industry. And each year many of them, dedicated but discouraged, leave the campus for jobs that pay fair, competitive salaries.

*Can you blame them?*

These men are not opportunists. Most of them would do anything in their power to continue to teach. But with families to feed and clothe and educate, they just can't make a go of it. They are virtually *forced* into better paying fields.

In the face of this growing teacher shortage, college applications are expected to *double* within ten years.

At the rate we are going, we will soon have a very real crisis on our hands.

We *must* reverse this disastrous trend. You can help. Support the college of your choice today. Help it to expand its facilities and to pay teachers the salaries they deserve. Our whole future as a nation may depend on it.

**It's important for you to know more about what the impending college crisis means to you. Write for a free booklet to: HIGHER EDUCATION, Box 36, Times Square Station, New York 36, N.Y.**

ADVERTISING COUNCIL PUBLIC SERVICE

*Sponsored as a public service, in co-operation with the Council for Financial Aid to Education*

HIGHER EDUCATION KEEP IT BRIGHT

# We torture our plastic pipe more than you ever will

We stretch USS National Polyethylene Pipe to find its breaking point. This is just one of the ways our Research Laboratory measures plastic pipe performance. Test conditions are far more severe than those found in normal use.

A length of USS National Polyethylene Pipe is stretched by the tension machine until it shatters. Pulling forces are much greater than specification. This and other tests show that our plastic pipe has strength to spare for mine drainage applications.

USS National Polyethylene Pipe is unaffected by exposure to corrosive mine water, many acids, alkalies, salts and other mine chemicals. National Polyethylene Pipe performs from —90 F. to +120 F., and it won't crack or break in sub-zero weather.

You can get USS National Polyethylene Pipe from ½″ to 6″ diameter in a variety of wall thicknesses. It's light, flexible and easy to handle, and thus reduces installation costs. For detailed information, write National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

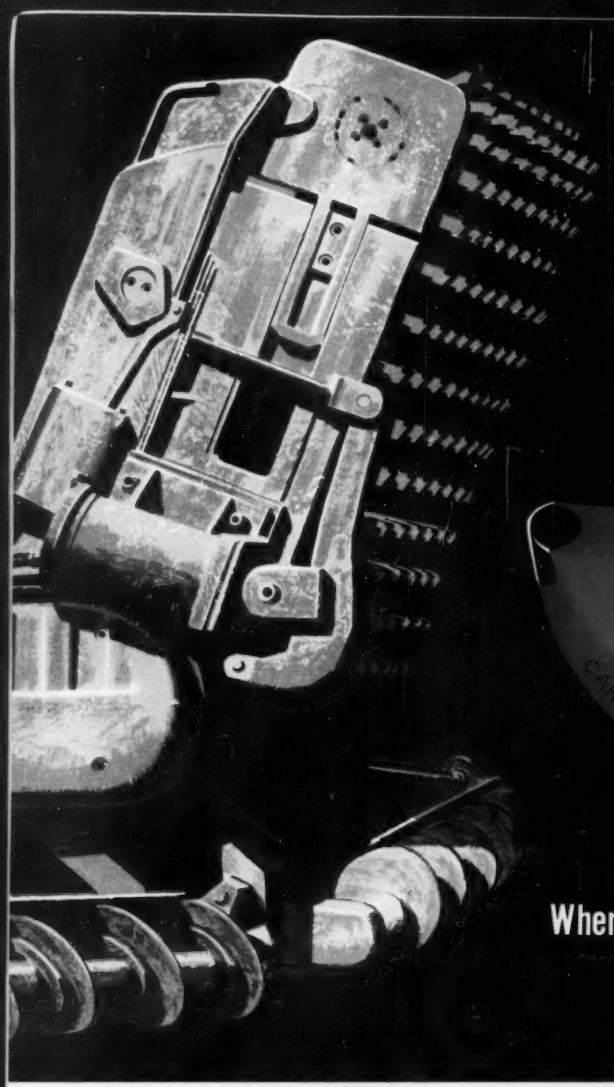
*USS and National are registered trademarks*

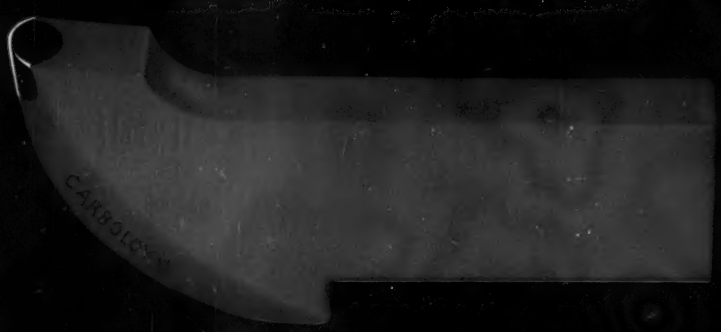
**National Tube Division of United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Export Company, New York

Metallurgical Memo from General Electric

# Why gamble with 200 to 1 odds?






## When you can protect your "miner" investment with Carboloy® machine bits

Bit illustrated: CCS-2

**ADN STYLE**

**Auger Bit**—Tipped with the finest carbide made—for longer tool life . . . "V" prong for faster penetration. (Square and Hex shank.)

**CC-8 STYLE**

**Machine Bit**—Negative Rake, stronger cutting edge . . . tip, in compression, with greater support utilizes maximum carbide strength . . . fewer bit changes.

### Proved uniform quality, mine engineered, more grinds per bit, more tonnage per dollar

Can you afford to gamble on anything but first quality bits? Consider the big investment in your drills, continuous miners, etc. Stack the cost of any one of these pieces of equipment against the cost of teeth that do the cutting. The odds are big in favor of the finest quality bits. That is the reason so many operators are making replacements with Carboloy mining tools . . . the silver-colored bits. Your Carboloy Mining Tool Distributor has them for immediate delivery. If not, write or phone Metallurgical Products Department of General Electric Company, 11120 E. 8 Mile Ave., Detroit 32, Michigan.

**CARBOLOY®**
CEMENTED CARBIDES

METALLURGICAL PRODUCTS DEPARTMENT

**GENERAL ELECTRIC**

CARBOLOY® CEMENTED CARBIDES • MAN-MADE DIAMONDS
MAGNETIC MATERIALS • THERMISTORS • THYRITE® • VACUUM-MELTED ALLOYS

## Complete service through factory and distributor assistance

AUTHORIZED CARBOLOY MINING TOOL DISTRIBUTORS

**ALABAMA**
Birmingham 2—Shook & Fletcher Supply Company

**COLORADO**
Denver—The Mine & Smelter Supply Company

**ILLINOIS**
Mt. Vernon—Pickard Industries, Inc., Central Mine Supply Division

**INDIANA**
Terre Haute—The Mine Supply Company, Inc.

**KENTUCKY**
Harlan—Kentucky Mine Supply Co., Inc.
Hazard—Speck Cornett Supply, Inc.
Madisonville—Pickard Industries, Inc., Central Mine Supply Div.
Pikeville—Big Sandy Electric & Supply Co.

**OREGON**
Portland—J. E. Haseltine & Company

**PENNSYLVANIA**
Charleroi—Mining Tool Service, Lee Supply Co.
Washington—Fairmont Supply Company

**TENNESSEE**
Knoxville—Crowell Engineering Company

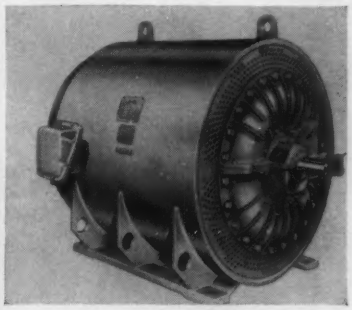
**TEXAS**
El Paso—The Mine & Smelter Supply Co.

**UTAH**
Salt Lake City—The Mine & Smelter Supply Co.

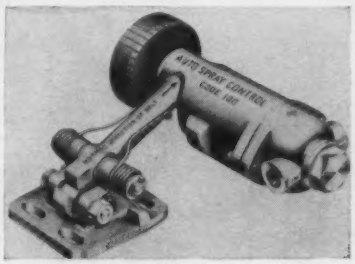
**VIRGINIA**
Andover—Central Supply Co., of Va., Inc.
McClure—Erwin Supply Company

**WEST VIRGINIA**
Bluefield—Bluefield Supply Co.
Bluefield—Fairmont Supply Company
Bluefield—Rish Equipment Company
Charleston—Rish Equipment Company
Clarksburg—Rish Equipment Company
Fairmont—Fairmont Supply Company
Montgomery—Marathon Coal Bit Company, Inc.
Shinnston—Erwin Supply Company


## Equipment News (*Continued*)



tube-cooled air-to-air heat exchanger motors ranging up to 2,000 hp. They are built in standard enclosed construction for use in non-hazardous locations and in explosion-proof construction with Underwriters Laboratories Class 1, Group D Label for use in hazardous locations. Designed to operate in unfavorable environmental conditions, the motors provide protection against excessive moisture, oil vapor, chemicals, alkalies, coolant, air-borne dust, sand, dirt and metallic particles.




**DUST CONTROL**—The Conflow Code 100 Auto Spray control, newly offered in the United States by Megator Corp., 930 Manchester Ave., Pittsburgh 12, has as its purpose dust control, dampening, quenching and other similar uses. The unit automatically regulates a spray of water or fluid on to transported materials. Used with a belt conveyor, the device insures uniform wetting of the load and cuts off spray operations when the load becomes stationary. It can be hooked directly to the conveyor belt so the conveyor's own motion powers the unit. Reversal of drive rotation is not detrimental in any way to the Conflow system, adds the company.

**HYDRAULIC VALVES** – Improved back-pressure characteristics and increased system efficiency are benefits achieved by a new line of parallel circuit, directional hydraulic valves, reports the manufacturer, Commercial Shearing & Stamping Co., Youngstown, Ohio. Called the "Velvet Touch" line, the Model A, Series 20 and Model A, Series 35, valves have ratings of 20 and 35 gpm and 2,000-psi systems pressures. Designed into the new valves is an extremely high degree of flow metering, a result of precision-engineered exponential curved edges on spool lands. This design eliminates jerky movements in mobile or crane equipment by metering in or out. Valves have extremely low back pressure, increasing by as much as 50% work performance in terms of internal pressure drops, says the firm.

**SURVEYING** – The Geodimeter Co., Div. of AGA Corp. of America, 2013 Park Ave., South Plainfield, N. J., has announced its new electronic distance-measuring device. Called the Model 4B, it offers a number of advantages over previous models: 25% reduction in pointing time, operation in a wider range of temperatures from minus 40F to plus 120F, weight reduction of 20% and faster reading with less chance of errors, according to the company.

**COMMUNICATIONS** – Transistors continue to play an important part in increased power and greater compactness as seen in this new 100-W vehicular communications unit made by General Electric Communications Products Dept., Lynchburg, Va. Called by the firm the highest-powered two-way radio yet to be made in a small-case size, the equipment comes in low-band frequencies, 25 to 50 mc. The packaging case is only 4 in high, 8⅝ in wide and 15 in long, and mountable under the dash in most cars or trucks. Despite increased power, the new unit draws only 1.75 amps when on and ready to transmit, reducing drain and decreasing battery problems.

**LONG-LIFE BATTERY**—A truly industrial-type battery which delivers 9 to 30% more electrical energy than automotive-type batteries without excessive size is the description applied to the new Exide 3-KCS-9, from Exide Industrial Div., The Electric Storage Battery Co., Phiadelphia 20. Designed specifically for long power-drain service that electrically powered vehicles demand, the 3-KCS-9 has a predicted minimum service-life of 4 yr, according to Exide. Unlike automotive batteries that are built to be recharged by a car generator right after starting, the 3-KCS-9 is de-

**MOUTHFULS UP TO 100 TONS.** The Midland shovel—one of the world's largest electric shovels—is shown removing overburden at the Midland Colleries, Inc. open-pit mine at Victoria, Illinois. Raw coal is then picked up by smaller shovel, and shipped to terminal points for processing, before being sent to industrial and electric-utility users in Illinois and Iowa.

# CABLE'BILITY

## at work

## Okocord gives Midland giant its "bite"

**Cable'bility** (cā'ble·bil'·i·ty) *new word.* *Noun.* **1.** Ability to design and manufacture electrical cables that give outstanding performance. **2.** Having long background and wide experience in cable research and application. **3.** Possessing keen understanding of customers' problems. Implies eagerness to serve faithfully and dedication to progress. **Syn.** The Okonite Company.

It's giant, all right. A shovel as tall as a 14-story building . . . weighing 2900 tons . . . capable of gobbling up 70 cubic yards of earth and rock at every bite. And its giant appetite for power—at 7200 volts every second of every day—is supplied by tough, flexible Okocord cable.

The shovel is one of the five largest power shovels in the world. Owned by Midland Colleries, Inc., and operated at their open-pit mine in Victoria, Illinois, it strips away soil, shale and rock to expose the coal bed 50 feet below the surface. Snaking behind it is the 1000-foot Okocord lifeline that connects the giant's motors to a terminal box on the surface.

Midland Superintendent Charles German sums up what he desires in a cable in one word: "Durability." Each day the cable is twisted, scraped across coal deposits, exposed to heat and dampness—without downtime.

What Okocord does for the Midland shovel, it can do for *your* machines, large or small. Okocord's durability—the result of its toughness and flexibility combined with excellent resistance to moisture, heat and corona-cutting—makes it a wise investment for trouble-free mining operations. This is Cable'bility. For complete details write for Bulletin CA-1108. The Okonite Company, Subsidiary of Kennecott Copper Corporation, Passaic, N. J.

***where there's electrical power . . . there's* OKONITE CABLE**

7737

# OLD BEN MINE NO. 21

## PREPARATION PLANT

*Designed, Engineered and Built by*

**ROBERTS & SCHAEFER**

Roberts & Schaefer's engineers, in cooperation with the Old Ben engineering staff, designed the preparation plant at Mine No. 21 to incorporate the industry's most advanced techniques for efficient and economical handling and cleaning of coal. This modern new plant will help the Old Ben organization produce large tonnages of low-sulfur metallurgical coal so urgently needed by coal-using industries in the Middle West.

ENGINEERS & CONTRACTORS

**ROBERTS & SCHAEFER** Company

DIVISION OF THOMPSON-STARRETT COMPANY, INC.

201 NORTH WELLS STREET, CHICAGO 6, ILLINOIS

NEW YORK 19, N.Y. • PITTSBURGH 22, PA. • HUNTINGTON 10, W. VA. • ST. PAUL 1, MINN.

SELECTIVE CONTROL SAVES MONEY!

**NOLAN**

**HOLD-A-TRIP**

– a sturdy, simple holding or braking unit to control trips on downgrades – to be used only WHEN and WHERE needed!

**Continuous braking or adjustable by interlocked control with hydraulic or mechanical car feeders**

**Assures minimum tractive effort or horsepower by automatically adjusting to only required braking effort**

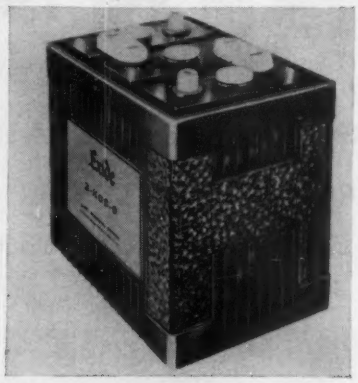
**WRITE FOR FREE CATALOG**

NOLAN SALES AGENTS: George C. Hutchinson, Jr., 800 Keenan Building, Pittsburgh, Pa.; Huntington Supply & Equipment Co., 423 First Huntington Nat'l Bank Bldg., Huntington, W. Va.; E. C. Horne Machinery Co., 1726 Champa Street, Denver 2, Colorado; Frank C. Mommott, P.O. Box 154, Castle Gate, Utah; J. L. Thomas, 429 South 24th Street, Birmingham 5, Alabama; John North Associates, P.O. Box 105, Herbert, Mich. (Chicago District); Lovitt Safety Limited, Toronto 10, Canada.

**THE NOLAN COMPANY**

106 Pennsylvania St., Bowerston, Ohio

## Equipment News *(Continued)*



signed to keep heavy-duty electric trucks and mine locomotives working through long shifts without intermittent changing. Resulting advantages are better performance, more hour's service per charge with less downtime, and lower cost of maintenance, according to the firm.

**SUBMERSIBLE PUMP**—Expanding the versatility of its existing 1½-in Model B-38L electric submersible pumps, Flygt Corp., Hossick Falls, N. Y., is now marketing a 110-V version, equipped with a 1.8-hp motor. With capacities to 85 gpm and heads to 90 ft, this model draws only 13 amps, permitting it to be operated from most house currents and portable light plants. The pumps are available in 100- and 220-V single-phase and 220/440-V three-phase models.

**PREFORMED SLINGS**—Hi-Pli, a new series of registered preformed cable-laid slings, is a product of the Wire Rope Sling Dept., American Chain & Cable Co., Inc., Wilkes-Barre, Pa. Designed for ease of handling, the slings offer the flexibility and non-kinking advantages of hemp rope plus the strength of steel, says the firm. Because preformed wire rope is free from internal stress, ACCO notes, it is easier to handle, faster to

install and has no inclination to loop or kink. Also, it has less tendency to rotate and it spools better. Made from a combination of a specified number of individual wire ropes and laid around a steel center core, these slings are so flexible that knots can be tied into them without harm. They are coated for corrosion resistance.

## Equipment Shorts

**Contact Seals**—For ball bearing unit applications where a "contact-type" seal is desired, the Sealmaster Bearing Div., of Stephens-Adamson Mfg. Co., Aurora, Ill., offers contact seals with low-cost "L" Series bearings units. This contact seal has three-part assembly. The assembly presses on the I.D. of the outer race. The inner flinger rides in close-running clearance with the O.D. of the inner race. The outer flinger consists of a solid circular ring. The L Series line features precision one-piece malleable iron housings for greater strength and light weight. Units are ready for easy assembly on the shaft, eliminating loose pieces which require high-cost additional assembly on the job.

**Lighting** — Low-cost floodlights are new from Stonco Electric Products Co., Kenilworth, N. J. They feature high-output anodized aluminum reflectors for effective light control with minimum glare. The new floods come open or fully enclosed with a heat-resistant cover lens and resilient neoprene rubber gasket.

**Valves**—Crane Co., Chicago 5, has introduced a new line of iron gate valves which will lower valve costs on many applications, according to the firm. The new ductile iron valves are said to be 3 times as strong as gray cast iron, nearly as strong as carbon steel, yet are not as high in cost as steel valves. Advantages cited are higher thermal shock resistance than ordinary gray cast iron and good corrosion resistance.

**Temperature Check**—New Temperature-indicating materials, Thermocron

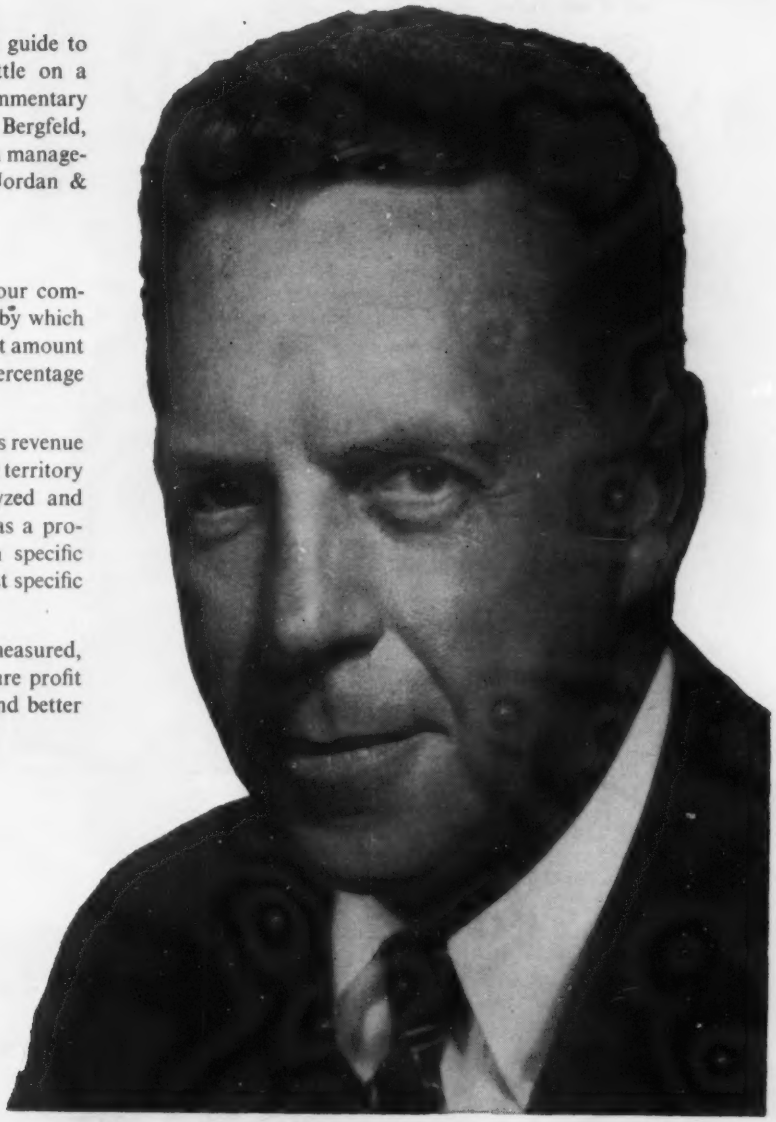
# "What's so bad about basing the ad budget on last year's shipments?"

Management men, seeking a reliable guide to advertising appropriations, often settle on a percentage of sales. The following commentary on this practice was written by A. J. Bergfeld, President of the internationally known management consultant firm of Stevenson, Jordan & Harrison, Inc.

"Past practices of your own or of your competitors will produce no magic ratios by which you can either judge or budget the right amount of advertising automatically as a percentage of past sales.

"Plans for increasing sales volume, sales revenue and resulting profits by product and by territory or by divisions, can better be analyzed and approved by considering advertising as a programmed cost to be associated with specific profit plans and to be measured against specific results.

"Programming advertising costs as a measured, reasoned and integrated part of a future profit plan usually results in a better plan and better actual future profits."



AIA

**ASSOCIATION OF INDUSTRIAL ADVERTISERS**

*271 madison avenue • new york 16, n. y. • telephone murray hill 5-8921*

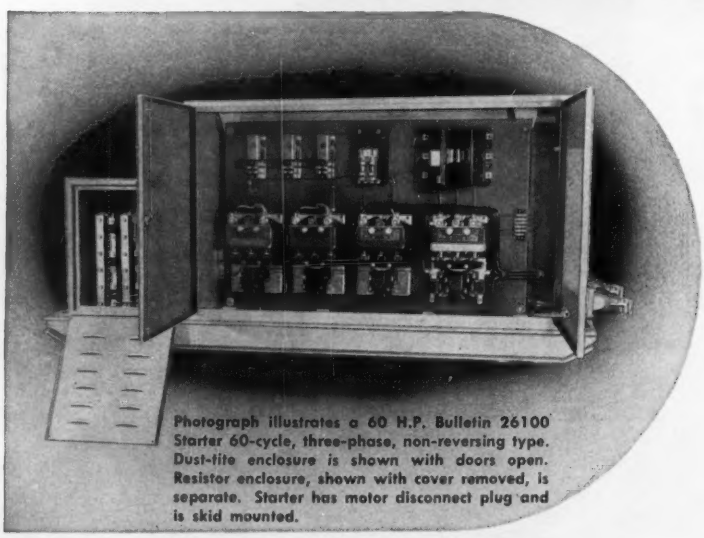
An organization of over 4000 members engaged in the advertising and marketing of industrial products, with local chapters in ALBANY, BALTIMORE, BOSTON, BUFFALO, CHICAGO, CLEVELAND, COLUMBUS, DALLAS, DENVER, DETROIT, HAMILTON, ONT., HARTFORD, HOUSTON, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, MINNEAPOLIS, MONTREAL, QUE., NEWARK, NEW YORK, PHILADELPHIA, PHOENIX, PITTSBURGH, PORTLAND, ROCHESTER, ST. LOUIS, SAN FRANCISCO, TORONTO, ONT., TULSA, YOUNGSTOWN.

ENSIGN-CLARK

A. C. Magnetic WOUND ROTOR

MOTOR STARTERS

for . . . BELT CONVEYORS



Photograph illustrates a 60 H.P. Bulletin 26100 Starter 60-cycle, three-phase, non-reversing type. Dust-tite enclosure is shown with doors open. Resistor enclosure, shown with cover removed, is separate. Starter has motor disconnect plug and is skid mounted.

ENSIGN-CLARK

A. C. MAGNETIC STARTERS ARE ALSO AVAILABLE IN MANUAL REVERSING AND MAGNETIC REVERSING

OPTIONAL FEATURES:

- NEMA 1 Dust-tite or Bureau of Mines Construction.
- Circuit Breaker Disconnect.
- Belt Slippage Protection when used with Centrifugal Switch.
- Control Circuit Transformer.
- Sequence operation when used with Centrifugal Switch.
- Motor Disconnect Plug.
- Skid Mounting.

ENSIGN

ELECTRIC AND MANUFACTURING CO.

914 Adams Avenue Huntington 4, W. Va.


## Equipment News (*Continued*)

crayons and DetectoTemp paints, are now being marketed by Air Reduction Sales Co., New York 17. These temperature-measuring devices indicate the temperature of any hot surface by distinct changes in color. The crayons and paints can be used on all hot surface including those exposed to reducing atmospheres, atmospheric moisture or carbon dioxide.

## Free Bulletins

**Lubrication**—Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa. Bulletin describes specifications, advantages and test results for Sun 2-cycle engine oil for use in engines where lubricating oil is mixed with gasoline.

**Barber-Greene Co.**, Aurora, Ill. Catalog, 44 pp, on idlers for belt conveyors, covers applications and describes and illustrates more than 800 units.

**Communications** — General Electric Co., Communications Products Dept., Lynchburg, Va. New bulletin, No. ECR-497B, shows communication equipment available for business and industry.

**Crusher** — Bath Iron Works Corp., Pennsylvania Crusher Div., West Chester, Pa. Bulletin 2020 describes the "Hercules" single-roll crusher, a new addition to firm's line. Unit is recommended for heavy-duty primary or secondary crushing.

**Track Scales**—Cardinal Scale Mfg. Co., Box 151, Webb City, Mo. Publication describing all-steel fabricated Murphy-Cardinal railway track scales available from firm. Capacities are 120 to 200 tons.

**Footwear**—B. F. Goodrich Footwear & Flooring Co., Watertown, Mass. New catalog available for those interested in industrial footwear.

**Cutting Edges** — Caterpillar Tractor Co., Peoria, Ill. Write for Form 33708 for information on cutting-edge replacements. How cutting edge costs can be reduced is the subject of this catalog.

**Loaders**—Goodman Mfg. Co., Halsted St. and 48th Place, Chicago 9. Catalog No. G-145, entitled "Goodman 960 Series Tractor Tread Loaders," describes machines which come in AC or DC models for high capacity loading of coal and other materials. Pictures, diagrams and specifications fill out this two-color brochure.

**Compressors** — Allis-Chalmers Mfg. Co., Milwaukee 1. Company is making available what it calls most complete catalog ever offered on performance and engineering data about its scroll casing design single-stage centrifugal compressors for air applications.

# HERE'S THE LINE UP— TAKE YOUR PICK!

*In the market for carriage bolts?*
*We make a full line of sizes.*
*Lag, and machine bolts also.*
*And they're all top quality.*

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

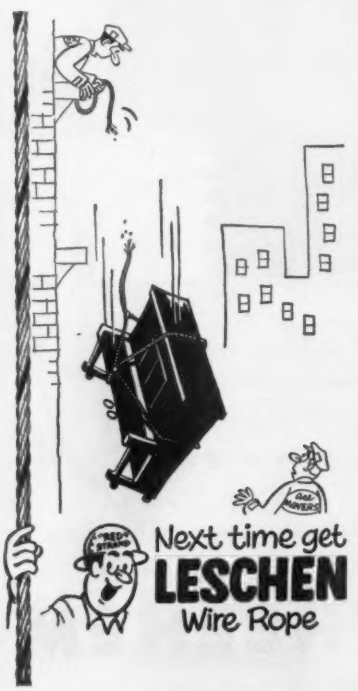
Export Distributors: Bethlehem Steel Export Corporation.

**BETHLEHEM STEEL**

# Among the Manufacturers

**Nelson W. Hartz has been named director of marketing for all industrial operations of Mine Safety Appliances Co., Pittsburgh, and John P. Sherwin has been selected as sales manager for the firm's Technical products Div., succeeding Mr. Hartz in that post.** Mr. Hartz joined Mine Safety in 1934 and has made notable contributions to MSA developments in industrial and air-pollution instrumentation. He was named product line manager for instruments in 1947 and sales manager for Technical Products in 1957. Mr. Sherwin joined the company in 1946 as an instrument field engineer and was named assistant sales manager for Technical Products in 1957.

**The Jeffrey Mfg. Co.'s Mining Div. has announced new appointments in the Bluefield, W. Va., district. P. M. Campbell,** formerly a sales engineer, is the new assistant district manager. **Milton Harper** is apparatus sales engineer in the No. 133 (N&W) territory. He had been in a training program on Jeffrey equipment and previously was a mine superintendent, Island Creek Coal Co. **Court Clarke** is renewal parts sales engineer for the Beckley territory, having completed the Jeffrey training program.



**Robert B. Bradley is the new vice president and executive head of International Harvester Co.'s Construction Equipment Div. He succeeds Harald T. Reishus, who retired.** Joining the firm in January, 1929, Mr. Bradley was a salesman in the Oklahoma City district office, later becoming a zone manager. In 1935 he was named assistant district manager at Wichita, Kan., and 2 yr later went to the Kansas City district office in the same capacity. After working his way through a number of positions, Mr. Bradley was appointed assistant director of foreign operations, and finally, president of International Harvester Co. of Canada, Ltd.

Bradley

**A. G. Gilbert has joined the sales engineering force of McNally Pittsburg Mfg. Corp., specializing in the treatment of fine coal, flotation, water clarification and cyclonic classification.** Mr. Gilbert will be active in an area including the coal fields of Pennsylvania, West Virginia, Virginia and eastern Kentucky. Before coming to the McNally Pittsburg organization, Mr. Gilbert had been employed as general sales manager for the Wilmot Engineering Co., White Haven, Pa.

Gilbert

**William J. Loudermilk Jr., has been named sales representative for the southern West Virginia territory of Long-Airdox Co., Div. of Marmon - Herrington Co., Inc.** Mr. Loudermilk has 13 yr experience in mining and studied mining engineering at the West Virginia Institute of Technology. He entered coal mining in 1947 as transitman in the Engineering Dept. of Eastern Gas & Fuel Associates' Powellton No. 6 mine, Powellton, W. Va. He moved up through a variety of jobs until April, 1960, when he joined Long-Airdox. He is affiliated with the Kanawha Valley Mining Institute.

Loudermilk

**Goodman Mfg. Co., Chicago, reports two changes in sales personnel. Harold Nordness** who has been a sales engineer in Illinois for Goodman is now sales engineer in the company's Pittsburgh office for northern West Virginia. Mr. Nordness has established residence in Fairmont, W. Va. He is replacing **Paul Johnson,** who moves from the Pittsburgh office to Chicago, where he will be manager of technical training.

Nordness

**John P. Steel has been appointed assistant to the sales manager of the Mining Tool Div. of Kennametal, Inc., in Bedford, Pa.** Mr. Steel joined Kennametal in Latrobe, Pa., in 1955, and was in the firm's Advertising Dept., where he specialized in mining tools until taking up his new duties in Bedford. A graduate of the University of Pittsburgh, he had previous advertising experience with Rockwell Mfg. Co. and Joy Mfg. Co. He will report to Edward J. Carroll, sales manager, Mining Tool Div.

Steel

**Henry Rumfelt, mining engineer in the International Div. of Bucyrus-Erie Co., South Milwaukee, Wis., recently received a professional degree in mechanical engineering from Texas A&M College.** A 1931 A&M engineering graduate, Mr. Rumfelt earned his new degree by fulfilling several technical requirements, including the preparation of a thesis based upon a new approach to the solution of stripping problems, one which would take advantage of a digital computer. Mr. Rumfelt has been with Bucyrus since September, 1948.

Rumfelt

**Milton C. Stafford** has been named manager, product sales, for the Jones Machinery Div., Hewitt-Robins, Inc., maker of power transmission equipment.

**J. F. Cronin** has been appointed manager of the Mining, Materials Handling and Electrolytic Processes Sales Unit of General Electric's Industrial Commercial Sect., Apparatus Sales Div., Schenectady, N. Y.

## PROFESSIONAL SERVICES

**ALLEN & GARCIA COMPANY**
More than 50 Years' Service to the Coal and Salt Industries
Consultants, Construction Engineers and Managers
Authoritative Reports and Appraisals
332 S. Michigan Ave., Chicago
120 Wall Street, New York City
816 Chappell Rd., Charleston 4, W. Va.

**EAVENSON, AUCHMUTY & GREENWALD**
*Mining Engineers*
COAL OPERATION CONSULTANTS
VALUATIONS
2720 Koppers Bldg. Pittsburgh 19, Pa.

**MOTT CORE DRILLING CO.**
*Contractors*
Exploration of Coal Properties. Guarantee satisfactory coal cores. Inside Mine Drilling. Pregrouting. Mine Shafts. Large diameter holes.
Huntington 17, W. Va.

**AMERICAN AIR SURVEYS, INC.**
TOPOGRAPHIC MAPS FOR MINING
AERIAL PHOTOGRAPHS
907 Penn Ave., Pittsburgh 22, Pa.
Offices—Manhasset, N.Y.—Atlanta, Ga.

**THERON G. GEROW**
*Mining Consultant and Engineer*
1705 Morgan Ave. So. Minneapolis 5, Minnesota

**DAVIS READ**
*Consulting Engineer*
Layout — Operation
Modern Production Methods
Plant Design — Preparation
1020 Adams Street Sturgis, Ky.

**ATLAS RAILROAD CONSTRUCTION CO.**
*Railroad Track Specialists*
Engineering Construction
Maintenance
Express Highway West
Bentleyville, Pennsylvania

**HOFFMAN BROS. DRILLING CO.**
*Drill Contractors Since 1902*
Specialists in exploratory—grout hole and pressure groutings. Rigs located in over 50 strategic areas for prompt service. Free estimates.
104 Cedar St. Punxsutawney, Penna.

**ROBINSON & ROBINSON**
*Consulting Engineers*
Mine Operation—Preparation
Coal Property Valuation
Industrial Engineering
Union Bldg. Charleston, W. Va.

**GEO. S. BATON & COMPANY**
"Founded 1900"
*Consulting Engineers*
Cost Analysis — Valuations
Mine and Preparation Plant Designs
1100 Union Trust Building Pittsburgh 19, Pa.

**KIRK & COWIN, INC.**
Ralph E. Kirk Percy G. Cowin
*Registered Professional Engineers*
*Consulting—Reports—Appraisals*
Mechanical Mining of Ore & Coal
Management and Construction of Mines
1—18th St., SW—Birmingham, Ala.
Phone St 6-5566

**PAUL WEIR COMPANY**
Established 1936
*Mining Engineers & Geologists*
DESIGN AND CONSTRUCTION
INDUSTRIAL ENGINEERING
20 North Wacker Drive Chicago 6, Illinois

**C. Ed BERRY**
*Coal Preparation Engineer*
SPECIALIZING
OIL TREATING—FREEZE PROTECTION
BULK DENSITY & HANDLING
702 Benoni Ave., Fairmont, W. Va. - Ph. 4592

**HERBERT S. LITTLEWOOD**
*Consulting Electrical Engineer*
Evergreen Hills Irwin, R.D. #3, Penna.

**J. W. WOOMER & ASSOCIATES**
*Consulting Mining Engineers*
Modern Mines Systems and Designs
Foreign and Domestic Mining Reports
Oliver Building—Mellon Square, Pittsburgh, Penna.

# CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

## EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

*ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.*
*NEW YORK 36: P. O. BOX 12*
*CHICAGO 11: 520 N. Michigan Ave.*
*SAN FRANCISCO 4: 68 Post St.*

### POSITION WANTED

**Management:** College graduate, age 26, 2½ years exp. on thin seam loader section mining. W. Va. forman's certificate. Desire management training program. PW—4961, Coal Age.

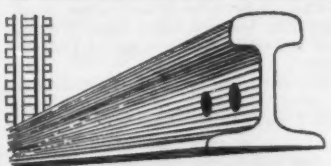
## At Your Service...

The Searchlight Section is at your service for bringing business needs or "opportunities" to the attention of men associated in executive, management, sales and responsible technical, engineering and operating capacities with the industry served by McGraw-Hill publications.

## COAL MINE FOR LEASE OR SALE

Upper Freeport Seam, metallurgical coal low in sulfur, high in fusion, strongly coking. Modern tipple houses 200 ton per hour Baum Jig which cleans run of mine coal, centrifugal dryer, heat dryer, cyclones, etc. Clean coal is sized into 4 primary sizes for loading on 3 tracks. Siding presently accommodates 60 empties, 44 loads. Present Reserves 3659 Acres, additional reserves available from present site: 3000-5000 acres. Favorable freight rate for eastern or northern shipments. Available with or without existing underground equipment which includes belt conveyors, piggy back conveyors, shuttle cars and loaders.

**Address all inquiries to BO 4810, Coal Age.**
**Class Adv. Div., P.O. Box 12, N.Y. 36, N.Y.**



**RELAYING • NEW RAILS**
**TRACK MATERIALS**
**MIDWEST STEEL CORP.**
612 DRYDEN STREET
CHARLESTON 21, W. VA.

"FASTER FROM FOSTER"
RAIL
& ALL TRACK EQUIPMENT
Nation's Largest Warehouse Stocks
L. B. FOSTER CO.
PITTSBURGH 30 • ATLANTA 8 • NEW YORK 7
CHICAGO 4 • HOUSTON 2 • LOS ANGELES 5

**STRIPPING SHOVEL**
For Sale Lima 2400 5yd. Hi Lift Stripping Shovel Good condition. Contact owners:
**Benedict, Inc. Coal Co.**
**Box O, McArthur, Ohio**

**20# — 30# — 40#**
**NEW RAIL IN STOCK**
**LEFTON INDUSTRIAL CORP.**
***Genl. Office: 212 Victor St.***
**St. Louis 4, Mo.**

## RUBBER PRODUCTS for IMMEDIATE DELIVERY

CALL, WIRE or WRITE
CARLYLE
THE
RUBBER HEADQUARTERS

**LOW PRICES, DEPENDABLE QUALITY FOR 40 YEARS**

**WHAT EVER YOUR RUBBER NEEDS ARE ! !**

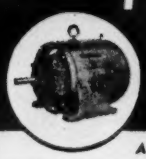
| | |
|---|---|
| AIR HOSE | HYDRAULIC HOSE |
| WATER HOSE | OIL HOSE |
| SUCTION HOSE | WELDING HOSE |
| DISCHARGE HOSE | VACUUM HOSE |
| STEAM HOSE | DREDGE SLEEVES |
| PILE DRIVER HOSE | SAND SUCTION HOSE |

CONVEYOR BELTING
ELEVATOR BELTING
"V" BELTS

*Write for complete catalogue*

**CARLYLE RUBBER CO., INC.**
103-107 WARREN ST. Digby 9-3810 NEW YORK, N. Y.

## POWER EQUIPMENT CO. Offers BARGAIN PRICES



ON GUARANTEED NEW and Rebuilt MOTORS

*August Specials*

**GUARANTEED REBUILT MOTORS**
**230 Volt DC Compound Wound**
**Unless Otherwise Noted**

| HP | MAKE | TYPE | SPEED |
|---|---|---|---|
| 100 | West. S.B. Open | SK-142L | 1800 |
| 100 | West. S.B. Open | SK-170 | 900 |
| 75 | Burke B. B. Drip | WA-6 | 1800 |
| 75 | West. S.B. Open | SK-140L | 1800 |
| 75 | West. S.B. Open | SK-160 | 900 |
| 60 | G.E.B.B. Drip | CDM-95 | 1800 |
| 60 | Al. Chal. S.B. Drip | DE-131 | 1200 |
| 45 | G.E.S.B. Open, Shunt | RC-14 | 1200 |
| 40 | Century B.B. Drip-New | DN375 | 1800 |
| 30 | West. B.B. Drip New | SK-93 | 1800 |
| 25 | West. S.B. Open | SK-100L | 1200 |
| 25 | G.E.B.B. Shunt | CD-93 | 1200 |
| 10 | G.E.B.B. Splash | CD-85 | 1800 |
| 10 | West. B.B. Drip. | CSP-324 | 1800 |
| 7½ | G.E.T.E.F.C. B.B. New | B-284 | 1800 |
| 5 | L.A.B.B. Drip | 05NA-254 | 1800 |

*Send for our FREE Catalog*

*Cash for your surplus new & used electric equipment. Send your list today.*

Large line of motors, control equipment, AC & DC Generators, Motor-generator sets, transformers.

Phone or Write Collect

**POWER EQUIPMENT CO.**
8 Cornet Rochester 2, N. Y.
Phone BEverly 5-1662

## HEAVY EXCAVATION EQUIPMENT

**DRAGLINES, SHOVELS, CRANES, DRILLS, TRUCKS**

15-W B.E. Elec. Drag, 215', 12 yd.
450-W B.E. Diesel Drag, 165' w/extra 10, 12, 13 & 14 yd. buckets.
9-W B.E. Elec. Drag, 165', 10 yd.
9-W B.E. Diesel Drag, 165' 12 yd.
7-W B.E. Diesel Drag, 140', 7 yd.
7400 Marion Diesel Drag, 175', 13 yd.
71-B B.E. Crane with 180' boom
625 Page Diesel Drag, 150', 10 yd.
1855 P&H Diesel Drag, 130', 10 yd.
621-S Page Diesel Drag, 125', 7 yd.
200-W B.E. Diesel Drag, 125', 6 yd.
2400 Lima Elec. Drag, 130', 6 yd.
2400 Lima Diesel Drag, 130', 6 yd.
4500 Manitowoc Drag, 120', 5 yd.
120-B B.E. Elec. Drag, 115', 5 yd.
111-M Marion Drag, 100', 4 yd.
1055 P&H Diesel Drag, 80', 4 yd.
1601 Lima 4 yd. Shovel/Drag
3900, 3500 & 3000 Manitowoc Cranes
5560 Marion 26 yd. Elec. Shovel
190-B B.E. 8 yd. Elec. Shovel
151-M Marion 7 yd. Elec. Shovel
1600 P&H 6 yd. Elec. Shovels
170-B B.E. 6 yd. Elec. Shovel
4161 Marion 6 yd. Elec. Shovel
2400 Lima 6 yd. Std. & H.L. Shovels
120-B B.E. 4 yd. Elec. Shovel
4500 Manitowoc 5 yd. H.L. Shovel
1055 P&H 3 yd. H.L. Shovel
1201 Lima 3½ yd. Standard Shovel
111-M Marion Standard & H.L. Shovels
3500 Manitowoc Standard & H.L. Shovels
54-B B.E. Standard & H.L. Shovels
Model T-650 REICHdrill Truck Mtd. Rotary & Down-The-Hole
Ingersoll-Rand Truck Mtd. & Crawler Mtd. Drill-masters
Keystone ±50 Truck Mtd. Stardrill
McCarthy & Compton Coal Auger Drills
Euclid Trucks, Dozers, Attachments, etc.

**FRANK SWABB EQUIPMENT CO., INC.**
313 Hazleton National Bank Bldg.
Hazleton, Pa., GLadstone 5-3658

## AERIAL TRAM

200 T.P.H. capacity (coal). 3,412 feet terminal to terminal. One clear span of 1500'. 37 buckets of 62 cubic ft. capacity. 4 track cables—lock coil. Haulage cable ¾" at 450 F.P.M. Counterweights for automatic tensioning. Large steel hopper with air operated undercut gates at loading end. Erection prints and operating data available. Located near Morgantown, W. Va. Inspection by appointment.

**TASA COAL CO.**
725 Liberty Ave. Pittsburgh 22, Pa.
EX 1-2141

## FOR SALE

2—Friday Heavy Duty Vertical Capstan, 15 HP, 220/440 volt, 3 ph., 60 cycle Car Pullers

1—Vulcan 8 Ton Locomotive, 4 speeds forward, 4 speeds reverse, 6 cyl. Hercules Gas Engine, 36" track gauge

1—¾ Yd. Koehring Shovel powered by Gen. Motors Diesel. In good operating condition. This machine is a shovel & drag combination. 50' drag boom, bucket & fairlead go with shovel

**LEO A. HARDING**
1625 Nay Aug Ave. Scranton 9, Pa.
Phones: Diamond 4-3120 or Diamond 2-2913

11 RU Cutting Machine
1—14 BU Joy AC Loader
2—512 Goodman Machine with Duster DC
3—312 Goodwin Machines 7½ & 8 ft. Bar
2—212 Goodman Cutting Machine
1—35L Jeffrey Cutting Machine
1—11B Sullivan Cutting Machine
1—600 Ton Bin
1—T2-5APE Cat Truck
1—Gasoline Hoist Practically new
1—Joy Aerdyne Fan

**ROTARY CONVERTERS**

3—750 KW 600 volt 1200 RPM Westinghouse Serial Number over 8 Millions Fabricated Based
1—500 KW 600 volt 1200 RPM General Electrical
2—500 KW Westinghouse 250/275 volt 1200 RPM
3—300 KW G.E. HCC6 Form P 1200 RPM
1—200 KW Allis Chalmers Rectifier
2—200 KW G.E. HCC6 Form P 1200 RPM
1—100 KW G.E. TCC6 Form P 1200 RPM
2—100 KW Westinghouse 1200 RPM
Transformers any voltage for above switching gear, & panel boards. ITE circuit breaker, hoist, etc.

**J. M. ALLARA CO.—IAEGR. W. VA.**
WELLS—88072 Shop WELLS—82156 or 82470 Night

FOR SALE

## DRAGLINES—SHOVELS—CRANES

All makes and Models
1/2 yd. to 35 yd.

## EUCLIDS:

Rear, Bottom Dumps and Scrapers

"Other equipment available not listed above"

**WILLIAM LUBRECHT, III**
Construction Equipment
311 W. Diamond Ave. Hazleton, Pa.
Gladstone 5-4041 5-0253

FOR SALE

## 500 H. P. NORDBERG MINE HOIST

Double Drum. Grooved for 1⅛" rope, 5000 Ft. Capacity. Drums 9' diameter. Post Brakes. Clutches 7' diameter. General Electric motor, switchboard, panel, complete. Lilly Model D Safety Stops. Presently used at 24,000 pound rope pull at 1200 fpm vertical.

This hoist located on West Coast. Must be moved immediately as property is being sold. Price is no object—it must be moved.

**FS-4832 COAL AGE**
**68 Post St., San Francisco 4, Calif.**

**2 TELEPHONES $24.95**

Inter-communication handsets, two wire system. Included Two 3 volt batteries, 50 ft. of wire and simple wiring instructions. Additional wire 1 cent per ft. or $25.00 per mile. Complete list of telephone parts, handsets, magneto—common battery — and dial telephones, switchboards, etc. All shipments FOB Simpson, Penna.

Telephone Engineering Co., Dept. CA-80, Simpson, Pa.

## LOCOMOTIVES

**THE IRONTON ENGINE COMPANY**
STORAGE BATTERY — TROLLEY
FARMINGDALE, NEW JERSEY
(Formerly Ironton, Ohio, 1902-1950)

**MOTORS • GENERATORS**
**TRANSFORMERS**
NEW • REBUILT
**ELECTRIC EQUIPMENT CO.**
WORLD'S LARGEST INVENTORY
CALL COLLECT GL 3-6783
P.O. BOX 51 • ROCHESTER 1, N.Y.

| | | |
|---|---|---|
| P | 2,000,000 ft. 2" .. 3.50¢ to the foot | P |
| | 1,000,000 ft. 3" .. 7.70¢ | |
| I | 1,000,000 ft. 4" .. 10.98¢ | I |
| | 500,000 ft. 6" .. 19.80¢ | |
| | 200,000 ft. 8⅝" .. 28¢ | |
| | 400,000 ft. 10¾" .. 35¢ | |
| P | 75,000 ft. 12¾" .. 40¢ | P |
| | 10,000 ft. 16" .. 42¢ | |
| E | All No. 1 Grade Plain End And Cleaned | E |

**INDIANA-OHIO PIPE CO.**
P.O. BOX 5412 Shepard Station
Phone CL. 3-5527 Columbus 19, Ohio

# LOOKING FOR AN ECONOMICAL WAY TO MECHANIZE TO MEET TODAY'S RISING MINING COSTS?

**Check our listing of modern mechanical equipment — whether to completely mechanize or further mechanize your operation — we offer the most complete stock of used and rebuilt machinery.**

## BUY — SELL — TRADE

## IF WE ADVERTISE IT — WE OWN IT

### A.C. MINING EQUIPMENT FOR SALE

2—12G-3 Goodman Cutting Machines, A.C.
2—11BU-10APH Joy Loading Machines, 220/440 Volts A.C.
2—4JCM Joy Continuous Miners, 440 Volts A.C.
3—7B Sullivan Cutting Machines, 220/440 Volts A.C.
1—T-1 Joy Machine Truck, A.C.
1—T2-5 Joy Machine Truck, A.C.

### LOADING MACHINES FOR SALE

1—18 HR Joy Loading Machine, 250 Volts D.C.
4—11 BU-10APE Joy Loading Machines, 250 Volts D.C.
1—14 BU-7BE Joy Loading Machine, 250 Volts D.C.
1—14 BU-3PE Joy Loading Machines, 250 Volts D.C.
6—12 BU-9E Joy Loading Machines, 250 Volts D.C.
4—8 BU Joy Loading Machines, 250 Volts D.C.
3—7 BU Joy Loading Machines, 250 Volts D.C.
2—Long 12″ Piggyback Conveyors, each 300′ long, complete with PT-12 Piggybacks and 12BU Joy Loading Machines.
2—14BU-7RBE Joy Loading Machines, 250 Volts, DC, excellent condition.

### SHUTTLE CARS FOR SALE

2—32E-16 Joy Shuttle Cars, 250 Volts D.C.
1—570-48 Goodman Shuttle Car, 250 Volts, D.C.
1—5SC Joy Shuttle Car, Elevating Discharge, Disc Brakes, 250 Volts D.C.—Modern.
1—6SC-7E Joy Shuttle Car.
2—6SC-5E Joy Shuttle Cars, Elevating Discharge, 4-Wheel Steering, 250 Volts D.C.
3—42E18 Joy Shuttle Cars, Disc Brakes, Elevating Discharge, Completely Modern, 250 Volts, D.C. 2-Standard, 1-Opposite Standard Drive.
1—32E16 Joy Shuttle Car, Disc Brakes & Elevating Discharge.
2—32 E-7 Joy Shuttle Cars.
1—10SC-2BPE Joy Shuttle Car, Permissible, equipped with 40J, 15 HP Motors.
1—10SC-2BPXE Joy Shuttle Car, Permissible, equipped with 40J, 15 HP Motors.

### CUTTING MACHINES FOR SALE

2—29LC Jeffrey Cutting Machines, 250 Volts D.C.
1—512 CJ Goodman Cutting Machine, 50 H.P. with bugduster.
2—10RU Joy Cutting Machines, 250 Volt D.C. with bugduster.
2—29UC Jeffrey Universal Cutters, Permissible, 250 Volts D.C.
1—512 CCH Goodman Cutting Machine, 250 Volts D.C.
5—35B Jeffrey Cutting Machines, 250 Volts D.C.
6—35BB Jeffrey Cutting Machines, 250 Volts D.C.
1—512DA Goodman Cutting Machine, 250 Volts D.C.
2—7AU Sullivan Cutting Machines, 250 Volts D.C.
3—212 AB Goodman Machines.
2—412 AA Goodman Machines.
1—35L Jefrey Machine.

### CONTINUOUS MINERS FOR SALE

2—1CM Joy Continuous Miners, 250 Volts D.C.
3—4JCM Continuous Miners, 440 Volts A.C.
1—5 JCM Joy Continuous Miner with self-tramming and extensive belt, 440 Volt AC, complete with 1000 feet of structure and belting with bridge conveyor between miner and belt.

### RECTIFIERS FOR SALE

1—400 KW American Selenium Rectifier, 4160 Volts Primary, 275 Volts D.C.

### ROTARY CONVERTERS FOR SALE

1—300 KW Westinghouse, Pedestal Type Converter, 275 Volts D.C., Primary 2300/4000.
1—150 KW Rotary Converter, Serial No. 1054562, with 150 KVA transformer and panel boards.
1—100 KW General Electric HCC-6 Rotary Converter, 1200 RPM, 2300/4000 Volts Primary, 275 Volts D.C., Pedestal Type.
1—150 KW Westinghouse Rotary Converter, Pedestal Type, 1200 RPM, 2300/4000 Volts Primary, 275 Volts D.C.
1—200 KW General Electric HCC-6 Rotary Converter, 1200 RPM, 2300/4000 Volts Primary, 275 Volts D.C., Pedestal Type.

### COAL DRILLS FOR SALE

1—Chicago Pneumatic RBD-30 Roof Drill.
25—CP-472 Electric Coal Drills, 250 Volts D.C.
5—CP-572 Coal Drills.
10—Chicago Pneumatic Little Giant 572 Coal Drills, 3 phase, 220 Volt A.C., permissible, New.
4—CD-25 Coal Drills, 250 Volts D.C.

### CRUSHERS FOR SALE

1—Cedar Rapids 20″ x 30″ Swing Hammer Crusher.
1—36″ x 36″ Double Roll Crusher, complete with 100 H.P. Motor.
1—18″ x 30″ Double Roll, Double Drive, Scottdale Crusher.
1—Robins 36″ x 36″ Double Roll Stoker Crusher, specially built with spike teeth equipped with extra set of new segments.

### COMPRESSORS FOR SALE

1—Joy WK-85 Air Compressor, Serial No. 53661, rubber mounted, self-propelled, 28½″ high, Model 240, maximum pressure 100 lbs.
2—Acme Self-propelled Air Compressors, 83R, Model 168, Capacity 176CFM, with 40 H.P. Reliance Compound Motor. Excellent Condition.

### LOCOMOTIVES FOR SALE

1—MH-88 Jeffrey Locomotive, 30″ high with CY-21 Reel, 44″ track gauge.
1—MH-150 Jeffrey Locomotive, 42″ track gauge. 250 Volts D.C., 26½″ high, rebuilt.
1—General Electric 6 Ton Locomotive with Reel, 36″ gauge.
1—1030 Goodman Locomotive, 24″ high, 44″ track gauge.

### ROCK DUSTERS FOR SALE

1—MSA Track Mounted Rock Duster, 10 H.P., A.C. or D.C., high pressure, 30″ high, any gauge.
2—MSA Bantam Rock Dusters, Rubber Tired, Portable.
2—MSA Bantam Rock Dusters, Skid Mounted.
1—American Mine Door, Wheel mounted bantam type rock duster, 250 Volts D.C., 22″ high.

### HOISTS FOR SALE

2—Brownie Hoists, 5 H.P., A.C.
10—#11½ Vulcan-Denver Material Hoists, Complete with 3 H.P. D.C. Compound Wound 1750 RPM General Electric Motor.
1—Brownie Hoist, Model HKM—Good condition.
3—Sullivan Type CHL, 5 H.P., Car Spotting Hoists.

### ELEVATORS FOR SALE

2—Joy PL11-16 Elevating Conveyors.

### MACHINE TRUCKS FOR SALE

1—T2-5APE Joy Machine Truck, 250 Volts D.C., equipped with hydraulic system for drill.
4—T2-5APE Joy Trucks, 250 Volts D.C. Permissible.

### CHAIN CONVEYORS FOR SALE

5—61AM Jeffrey Chain Conveyors, 10 H.P. 300′ long.
3—61HG Jeffrey Chain Conveyors, 5 H.P. 40′ long.
1—Jeffrey 300 ft. 15″ Chain Conveyor.

### DIESEL PLANTS FOR SALE

1—60 KW, G.M. Diesel Generator Set, with 60 KW, 250 Volt D.C. Delco Generator.
1—100 KW Waukesha Diesel Generator with 220/440 Volts D.C.
1—100 KW Diesel Generator Unit, with G.M. Diesel Engine and 100 KW Generator.
1—D13000 Caterpillar Diesel Generator Unit—with Caterpillar engine and 75 KVA G.E. generator self-regulating, 220 Volt A.C.

### MOTOR GENERATORS FOR SALE

1—150 KW General Electric Motor Generator Set, 2300 Primary, 275 Volts D.C.
1—150 KW General Electric Motor Generator Set, 440 Volts A.C. Primary, 275 Volts D.C.
1—50 KW Westinghouse MG Set, 440 Volt A.C., 250 Volt D.C.
1—300KW Westinghouse Motor Generator Set, synchronous motor, 433 KW Output, 435 KVA, 2200 Volts, 1200 RPM. D.C. generator 300 KW, 275 Volts, 1200 RPM. Compound Wound. Complete with D.C. panel and switch gear.
3—50 KW G.E. and Westinghouse Motor Generator Sets, 2300 Volts A.C., 275 Volts D.C. Complete with switching gear.
1—200 KW Ridgeway Motor Generator Set, Complete with switchgear and 1600 amp. I-T-E automatic circuit breaker, 2300 A.C., 275 Volts D.C.

### BELT CONVEYORS FOR SALE

1—Joy 15″—300 ft. Chain Line.
300 ft. Joy 15″ Pans and Chains.
700 ft. Goodman 30″, 97C Structure complete with drive.
2 only 1200′ 26″ Belt Conveyors with 30 H.P. 250 Volt D.C. Drives.
1—Type 93T24-36 Goodman 500 ft. Rope Belt Conveyor, complete.

### ROOF BOLTING MACHINES FOR SALE

5—Fletcher Roof Bolting Machines; with permissible dust collectors.

### THE FOLLOWING OFFERED AS A PACKAGE UNIT ONLY

1—5CM Joy Continuous Miner, 440 Volts A.C.
2—16SC Joy Shuttle Cars, matched pair, 440 Volts A.C.

### MISCELLANEOUS FOR SALE

1—Compton Model 56 Auger with 300 H.P. Cummins Diesel Engine Drive, 210 feet 38″ diameter auger (6 sections—35 feet each); 1—42″ cutter head, 70 feet, 48″ diameter auger (2 sections—35 feet each); 1—52″ cutter head.
1—300 KVA Underground Transformer, skid mounted, 40″ high.
3—75 KVA Underground Transformers, skid mounted, 40″ high.
3—30 KVA Underground Transformers, skid mounted, 40″ high.
2—3 H.P. Gear Motors with 15″ head and tail assemblies.
2—5 H.P. Gear Motors with 15″ head and tail assemblies.
3—75 KVA Transformers, 2300/4000 Wye to 220 Volts.
3—35B Jeffrey Armatures, 250 Volts D.C.
4—902, 250 Volts D.C. Westinghouse Motor Units, only.
1—PL 11-14 Joy Elevator.
10—Goodman 512 Cutter Bars and Chains.
173—AC&F 42″ Gauge, 48″ high Drop Bottom Mine Cars. Condition like new.
1—24″ Fan with drive.
2—7½ H.P. Tricycle Type Rubber Tired Mine Tractors, 7½ H.P. 220 Volt Single Phase Motors or 250 Volt D.C. Motors.
3—24 J Motors, 7½ H.P., 250 Volt D.C.
2—42″ Track Gauge Phillips Carriers.
1—Manson Mine Jeep 40″ Track Gauge equipped with 9J Motor.

*ALL EQUIPMENT LISTED AND HUNDREDS OF OTHER ITEMS ARE IN STOCK AND MAY BE INSPECTED AT OUR SHOP AND EQUIPMENT YARD LOCATED AT RALEIGH, WEST VIRGINIA*

## MOUNTAIN STATE EQUIPMENT COMPANY

**Box 1050, Beckley, West Virginia** — **Phone CLifford 3-7383**

J. J. MAHONEY
Res. Phone CLifford 3-6804, Beckley

WILLIAM R. MONK
Res. Phone CLifford 3-6907, Beckley

R. E. KAMM
Res. Phone 4281, Summersville

# NOT RUNNING FOR PRESIDENT!

**The promises we make are not based on politics—you can believe every word: We'll Buy any quantity of Mining Equipment or complete Mines including Railroads at any time you want to sell and at fair prices always. We'll Sell anything for the efficient mining of coal from one part to an entire mine, including tipples, and guarantee to save you money.**

**WE OWN WHAT WE ADVERTISE**

**JOY EQUIPMENT—REBUILT**

3—Joy 14 BU Loaders, low pedestal, 7AE, 1956 & 57.
6—Joy 14 BU Loaders, medium pedestal, 7RBE.
1—Joy 14BU 7CE high pedestal loader.
4—Joy 14BU 3PE Loaders.
2—12BU10E Joy Loaders complete with Piggybacks.
2—Joy 12BU Loaders, 9E, latest type. 250 V. DC
5—Joy 12BU Loaders, 220/440 V. AC
1—Joy 20BU Loader, latest type.
4—Joy 11BU Loaders, latest type.
1—Joy 8BU Loader, 34" overall height.
2—Joy 8BU Loaders, 220 V. AC.
1—Joy curved Bar Head, complete.
6—Reliance 24-J Motors, 7½ H.P.
4—Reliance 38-J Motors, 10 H.P.
20—9-J Motors, 4 H.P.
2—Goodman 660 Loaders on Crawlers 440 V. AC, like new.
1—Goodman 660 Loader on Crawlers, excellent 250 V. DC.
1—Goodman 665 Loader on Crawlers, latest type 250 V. DC.
1—Goodman 865 Loader, 26" hi. Rebuilt. 250 V. DC.
4—Joy 8SC Shuttle Cars, rebuilt.
4—Joy 6SC Shuttle Cars, rebuilt, latest type.
1—Joy 5SC Shuttle Car. Excellent.
2—Joy 32E9 Shuttle Cars.
2—Joy 32E10 Shuttle Cars, rebuilt.
2—Joy 32E15 Shuttle Cars, rebuilt.
4—Joy 32E16 Shuttle Cars, rebuilt.
10—Joy 42E16 Shuttle Cars, rebuilt.
2—Joy CD-22 Drills, on rubber, like new.
6—Joy T-2-5 low pan Crawler Trucks, rebuilt.
1—Joy T-2-6 low pan Crawler Truck with reel.
2—Joy T-1 Standard Crawler Trucks, 220 AC.
1—Joy T-1 Standard Crawler Truck, 250 DC.
2—Goodman low pan Crawler Trucks, like new, latest type.
4—Joy 11-B Cutting Mach., like new, 35 & 50 H.P.
1—Joy 7-B Cutting Machine, like new, 250 V. DC.
2—Goodman 212 Cutting Machines, 19" high.
4—Goodman 312 Cutting Machines, 17" high.
3—Goodman 412 Cutting Machines, 19" high.
1—Goodman Machine on Crawler, 31" high. All hydraulic.
6—Goodman 512 Machines with Bugdusters.
6—Goodman 612 Cutting Machines, 250 and 500 volt.
1—Lee Norse low vein Machine Carrier on rubber.
1—Jeffrey 70 URB rubber tired Cutter, Universal head, perfect condition.
1—Goodman 2410 Rubber Tired Cutter, Universal head, like new.
3—Joy 11RU Rubber Tired Cutters with bugdusters, Universal heads, dual tires, like new. 250 V. D.C.
2—Joy 10RU Rubber Tired Cutters, Universal head, 220/440 V. A.C. Perfect.
4—Joy 10RU Rubber Tired Cutters, Universal head, 250 V. D.C.
6—7AU's on track. Universal head.
2—Jeffrey 29UC Cutting Machines, Universal head, cuts anywhere in seam, 38" high, on Crawlers, 250 volt D.C.
1—Jeffrey 29LC on Crawlers, rebuilt.

**LOCOMOTIVES**

1—Goodman 6 ton, 93-A, 27" high, armor plate frame.
1—Jeffrey 15 ton MH-77 Locomotive, armor plate frame.
3—Jeffrey, 13 ton, type MH-110, 36", 42", 44" ga.
2—Jeffrey, 10 ton, type MH-110, 42" and 44" ga.
2—Jeffrey, 10 ton, type MH-78, 42" and 44" ga.
2—Goodman 8-30 and 10-30 Locos., 26" above rail.
1—Jeffrey MH-121, 4 ton, like new, with reel, 24" overall height.
2—Jeffrey MH-150, 6 ton, 26" overall height, rebuilt, with reel.
12—Jeffrey, 6 ton, type MH-88, 42", 44" and 48" ga.
4—Jeffrey, 8 ton, type MH-100 2½" armor plate frames.
1—Jeffrey, 6 ton, type 2186, 22" above rail.
3—Jeffrey, 4 ton, type MH-96, 42", 44", 48" ga.
1—G.E., 4 ton, type 825 Locomotive, 22" high.
10—G.E., 6 ton, types 801, 803, 821 Locomotives, 42", 44" and 48" ga.
1—G.E., 8 ton, type 822 Locomotive, 44" ga.
3—G.E., 10 ton, type 809 Locomotives, 42", 44" and 48" ga.
2—G.E. 13 ton, type 829 Locomotives, armor plate frames.
1—Goodman 91A Locomotive, 8 ton, 26" overall height.
2—Goodman, type 33, 6 ton, 44" and 48" ga.
3—Westinghouse, type 902, 4 ton, 42" and 48" ga.
2—Atlas Battery Locomotives 36" ga.
1—Atlas Trolley Locomotive, 4 ton, 24" high.
1—Ironton Battery Locomotive, 4 ton, 24" high, excellent, with charger.
2—Westinghouse, type 904, 6 ton, 44" and 48" ga.
2—Westinghouse, type 906, 44" and 48" ga.
2—Westinghouse, type 907, 10 ton, 44" & 48" ga.
8—Jeffrey MH-78 Locomotive Units, cheap.
4—Jeffrey MH-88 Locomotive Units, real bargains.
6—Jeffrey MH-100 Locomotive Units, reasonable.
3—Plymouth Diesel Locomotives, 8 and 10 tons, 42" and 44" ga.
Locomotive Trucks & Spare Armatures for the above.

**TIPPLE EQUIPMENT**

1—All Steel 5 Track Tipple, new 1957, complete with washer, silo, oil treating system, all bolted construction.
1—Complete Five Track Tipple with Washers and Air Tables.
1—Complete stoker plant, all steel.
2—Complete Tipples, 3 & 5 track, steel and wood.
3—Cleaning Plants, 1 Ea. McNally, Roberts and Schaefer, Jeffrey, Washers and Air-Flo Tables.
4—Complete Aerial Trams for coal or refuse.
3—Complete Rope and Button Lines.
2—Monitor Lines complete with Drums, excellent.
1—Allis-Chalmers 5' x 12' Rippflo Vibrator.
1—Allis-Chalmers 4' x 12' Low-Head Vibrator.
1—Robins Gyrex Vibrator, 4 x 10.
10—Belt and Apron type Loading Booms.
6—Shaker Screens.
1—Robins Car Shakeout.
20—Crushers, various sizes—Jeffrey, McLanahan & McNally.
4—Mine Scales, 10 & 20 ton.
5—Truck Scales, 25 to 40 ton, late type.
Feeders, Belt and Drag Conveyors, Car Retarders.

**CUTTING MACHINES**

2—Joy 10RU Rubber Tired Cutters, Universal head 220/440 volt A.C. Perfect.
4—Joy 10RU Rubber Tired Cutters, Universal head, 250 V. D.C.
3—Joy 11RU Rubber Tired Cutters, 250 V. D.C.
1—Goodman 2410 Rubber Tired Cutter, Universal head, new 1956. Excellent.
2—Jeffrey 29UC Universal Machines on Crawlers.
1—Goodman on Crawlers, 31" overall height.
3—Baby Goodman 212's, rebuilt, 250 V. D.C.
7—Goodman 212 Cutting Machines, 19" high.
4—Goodman 312 Cutting Machines, 17" high.
3—Goodman 412 Cutting Machines, 19" high.
6—Goodman 512's, with Bugdusters, like new.
4—Goodman 512's, rebuilt, or as removed from service.
6—Goodman 612's—250 & 500 Volt.
3—Goodman 112's, 220/440 V. A.C.
1—Joy 7-B Cutting Machine, 250 V. D.C.
4—Joy 11B Cutting Machines, rebuilt, 35 & 50 H.P.
6—7AU's, on track, Universal Head.
10—Goodman 12AA's and 112AA's, 250 V. D.C.
2—Goodman 324 Slabbers.
2—Goodman 724 Slabbers.
2—Goodman 824 Slabbers.
6—Jeffrey 35L's, like new, 17" high.
2—Jeffrey 35L's, on low vein trucks.
2—Jeffrey 35L's 220/440 A.C.
3—Jeffrey 35BB's, 220/440 A.C.
15—Jeffrey 35B's and 35BB's 250 V. D.C.
2—Jeffrey 29B's on track.
10—Jeffrey 29C's, track mounted.
2—Jeffrey 29L's, on Crawlers. Excellent.
1—Sullivan CE7, 220/440 V. A.C.

**CONVEYORS**

1—Robins 36" tandem drive with or without structure.
2—Jeffrey 52-B tandem drive 30" Belt Conveyors, 1,500'.
1—Jeffrey 52-B tandem drive 26" Belt Conveyor.
1—Joy 30" Underground Belt Conveyor. Excellent.
1—Goodman 97-C, 30" tandem drive.
1—Goodman 97-C, 26" Conveyor, 1,000' long.
1,200' Robins 36" Underground Structure, like new.
1,000' Conveyor Belt, 42".
4,000' Conveyor Belt, 36".
4,000' Conveyor Belt, 26".
8—Jeffrey 61AM 12" Chain Conveyors, 300'.
2—61EW Elevating Conveyors.
2—61WH 15" Room Conveyors, 300'.
2—Joy 15" Room Conveyors, 300'.
2—Joy 20" Conveyors, 300'.
4—Joy Ladel UN-17 Shakers.
10—Goodman G-12½ and G-15 Shakers.
1,000' Goodman 18" Flat Belt Conveyors, tandem drive any length. Perfect.

**CONVERTERS AND DIESEL PLANTS**

1—300KW Portable Rectifier, 3 car unit, excellent.
2—500KW G.E. Stationary Rectifiers.
4—1,000KW Stationary Rectifiers.
2—100KW, G.E. TCC-6's, 275 V., Rotary Converters.
1—150KW, G.E. HCC-6, 275 V., Rotary Converter.
1—150KW, 6 phase, Allis-Chalmers Rotary Converter, 275 V. D.C.
2—200KW G.E. HCC-6's, Rotary Converters, 275 V. D.C. Steel frames. Newly rewound.
3—300KW G.E. HCC-6's, Rotary Converters, 275 V. D.C. Like New.
2—300KW Westinghouse, 6 phase, Rotary Converters, 275 V. D.C.
2—500KW West Rotary Converters, 275 V. D.C.
2—200KW Westinghouse Rotary Converters, 275 V. D.C. Newly rewound.
(All the above with 6900/13000 and/or 2300/4000 primary transformers)
2—100KW MG Sets, 275 V. D.C.
2—150KW MG Sets, G.E. and West., 275 V. D.C.
1—200KW MG Set, West., rebuilt, 275 V. D.C.
1—200 KW MG Set, G.E., perfect, 275 V. D.C.
2—300KW G.E. MG Sets, like new.
1—300KW Westinghouse, 600 volt MG Set, rebuilt.
2—300KW Westinghouse, 600 volt, 6 phase, Rotary Converters.
2—500KW Westinghouse, 600 volt, D.C., 6 phase, Rotary Converters.
2—500KW HCC-6's, Rotary Converters, 6 phase, 600 V. D.C.
1—GMC-471 Diesel with 60KW, 250 V. D.C. Gen.
2—GMC-671 Diesels with 75KW, 250 V. D.C. Gen.
1—Cummins 125KW Diesel with 250 V. D.C. Gen.
1—Allis-Chalmers Natural Gas Engine with 100KW Generator, 275 V. D.C.
Boilers, like new, 500 H.P.

**LOADING MACHINES**

16—Joy Loaders, 14BU, 12BU, 8BU, 11BU, 20BU.
5—Joy 12BU9E Loaders, 220/440 V. A.C. Excellent.
3—Joy 12BU9E Loaders, latest type.
2—Joy 12BU with Piggyback Conveyors.
2—Goodman 865 Loaders, 26", on Crawlers.
1—Goodman 665 Loader, on Crawlers, rebuilt.
2—Goodman 660 Loaders, 440 V. A.C., perfect.
1—Goodman 660 Loader, on Crawlers, 250 V. D.C.
1—Goodman 460, on track, rebuilt, all hydraulic.
2—Jeffrey 61 CLR's on rubber, 26".
3—Jeffrey L-500 Loaders.
2—Myers Whaley, No. 3 Automatic Loaders.
2—Clarkson Loaders, 26" above rail.

**MISCELLANEOUS**

1—Complete Five Track Tipple with Washers and Air Tables.
5—Complete Tipples, 3 to 5 Track, Wood and Steel.
Steel Trestles for drop bottom cars.
All Steel Armco Buildings.
20—Jeffrey Molveyors on rubber tires.
1—¾ Yard Shovel and Back-Hoe.
1—¾ Yard Crawler Crane.
Battery Supply Tractors, Rubber Tired.
1—Cantrell Air Compressor on rubber tires.
10—Air Compressors, 1 H.P. to 40 H.P.
2—Joy self-propelled rubber tired comp., 240 cu. ft.
2—Acme self-propelled rubber tired compressors, 130 cu. ft.
40—Mine Pumps, all types.
1—Differential 40 Passenger Man-Trip Car.
6—MSA Rock Dusters.
2—Phillips Carriers, 44" and 48" ga.
1—Barber-Greene self-propelled Bucket Elevator.
Pipe, Plastic, Steel, Transit, all sizes 1" to 6".
300—Mine Cars, drop bottom, 42" ga.
90—Mine Cars, drop bottom, 44" ga.
50—Mine Cars, drop bottom, 48" ga.
100—Mine Cars, 18" high, end dump, 44" ga.
300—Mine Cars, end dump and drop bottom, 20" high, 48" ga.
1—10 ton Mine Car Scale with Recorder.
15—Brown Fayro HKL and HG Car Spotters.
1—Brown Fayro Hydraulic Car Spotter.
1—12 ton Differential Slate Larry.
Incline Hoists, 25 to 50 H.P.
1—Jeffrey 5' Aerodyne Fan, like new.
1—Jeffrey 6' Aerodyne Fan.
2—Storage Tanks, 4,000 Gallons.
2—Storage Tanks, 10,000 Gallons.
10,000 Five Gallon G.I. Cans, screw lids.
2,500 tons Relaying Rail, 25lb., 30lb., 40lb., 50lb., 60lb., 70lb.
30 Tons Copper—4/0 and 9 Section Trolley 1/0, 2/0, 4/0 Stranded.
Thousands of feet of rubber covered three conductor cable, All sizes.
300—Transformers from 1 to 300 KVA, 110 to 13,000 primary volts.
400—Electric Motors, 3 to 250 H.P.
Huge Stock of Mine Supplies.
600—MSA Mine Lamps, Chargers, etc.
4—Mine Scales, 10 & 20 ton.
5 Truck Scales, 25 to 40 ton, late type.
Mack & International tandem dump trucks.
**THOUSANDS OF OTHER ITEMS**

**WE BUY — SELL — TRADE**

**PHONE PL 2-4400**

# J. T. FISH

**LOGAN, WEST VA.**

# MOUNTAIN STATE EQUIPMENT COMPANY

HAS PURCHASED THE ST. ELLEN MINE OF PEABODY COAL COMPANY, O'FALLON, ILLINOIS, LOCATED ON U. S. ROUTE 50, APPROXIMATELY FIFTEEN MILES EAST OF ST. LOUIS, MISSOURI. THE ENTIRE STOCK OF EQUIPMENT AND APPROXIMATELY 400 ACRES OF LAND ARE BEING OFFERED FOR SALE AT BARGAIN PRICES.

**J. J. MAHONEY AND ROY FAIRCHILD CAN BE CONTACTED AT MINE SITE AT ALL TIMES.**

P. O. Box 150
O'Fallon
Illinois

Phone: MErcury 2-3621
MErcury 2-3622
MErcury 2-3623
Night Phone: MErcury 2-5887

## THE FOLLOWING IS A PARTIAL LISTING OF EQUIPMENT FOR SALE AT THE MINE SITE

**Shuttle Cars, 250 Volts DC**

11—Joy 10SC Shuttle Cars, right and left hand drive.
3—Joy 42-D Battery Shuttle Cars complete with batteries and chargers.

**Cutting Machines, 250 Volts DC**

5—10RU Joy Cutting Machines
5—324 AA Goodman Slabbers—Track Gauge 42"

**Trolley Locomotives, 42" Track Gauge for 250 Volts DC**

2—Goodman 20 ton 81A-42-108T with 3—120 H.P. Motors, completely modern.
1—13 ton Goodman — Type 81A04T, completely modern.
1—Goodman 13 ton 136B-0-4-6 with 2—75 H.P. Motors.
2—13 ton Jeffrey Locomotives, (1—inside frame and 1—outside frame)
1—Goodman 5 ton 3013 with 1—50 H.P. Motor.
4—8 ton 132AK42-48R Goodman with 2—50 H.P. Motors with reels.
1—8 ton 32-0-4-T Goodman with 2—50 H.P. Motors with reels.
1—8 ton LM2-8-T.DD General Electric with 2—50 H.P. Motors with reel.
3—6 ton LM2-T-6MM General Electric with 2—35 H.P. Motors with reel.
2—6 ton LM2-¢-6-11 General Electric with 2—35 H.P. Motors with reel.

**BATTERY LOCOMOTIVES, 42" Track Gauge**

18—Greensburg Monitors complete with charging equipment and batteries.
8—Mancha Locomotives complete with charging equipment and batteries.

**Loading Machines, 250 Volts DC**

9—11BU Joy Loading Machines, completely modern with separate pump motors.
6—360 Goodman Loading Machines.

**Motor Generator Sets**

8—General Electric 300 KW Motor Generator Set, 1200 RPM, primary voltage 2300/4160, 275 Volts DC Complete with panel boards.
5—General Electric 200 KW Motor Generator Sets, 1200 RPM, 2300/4160 primary voltage, 275 primary voltage 2300/4160, 1200 RPM, 275 Volts DC Complete with panel boards.
3—Westinghouse 200 KW Motor Generator Sets, 1200 RPM, 2300/4160 primary voltage, 275 Volts DC, complete with panel boards.
3—Westinghouse 150 KW Motor Generator Sets, 1200 RPM, 2300/4160 primary voltage, 275 Volts DC, complete with panel boards.

**Conveyors**

5—Joy PL 11 Elevating Conveyors
6—Joy PL 11 Side Dumps

**Belt Conveyors**

1—Hewitt Robins Slope Conveyor, 980 ft. long, 42" wide, equipped with 200 H.P., 440 Volt AC Drive (also 50 H.P. Volt AC Motor for man trip), complete with 42" x 6 ply Rubber Conveyor Belt, Ajax Raynile #130¼" top cover and 1/16" bottom cover with Nylon Breaker.
3,128 feet of Jeffrey 36" wide structure in 8 ft. sections.
2,296 feet of Joy 36" wide structure in 8 ft. sections.
10,848 feet of Rubber Belt 36" wide
3—40 H.P. Goodman 36" Belt Drives with Tail, 250 Volts DC.
1—Robins Belt Conveyor 36" wide, 150 ft. long complete with Allis Chalmers, 30 H.P., 220/440 Volt AC Drive.

**MINE CARS**

100—AC&F, Three-Door Drop Bottom Mine Cars, 48" High, 17 ft. 7¼ in. overall length, capacity 271 cubic feet level full, 42" gauge.
100—Sanford Day Three-Door Drop Bottom Mine Cars, 36" High with an 8" sideboard, 16 ft. 10½" overall length, 42" gauge.

**WIRE MATERIAL**

21,400 ft.—4/0 Round Return Wire
8,600 ft.—500,000 CM
50,000 ft.—1,000,000 CM
82,600 ft.—6/0 Trolley Wire
8,000 ft.—4/0 Rubber Covered 4000 Volt Feeder Cable.

**TRACK MATERIAL**

64,800 ft.—40# Track
154—40# Switches
10,800—40# Ties
100,400 ft.—60# Track
51—60# Switches
7,000—60# Ties

**COMPLETE FOUR-TRACK TIPPLE CAPABLE OF HANDLING 10,000 TONS OF COAL PER DAY**

Partial List of Major Items of Tipple:
Sizes of coal: from ¼ x 0 to 7 x 4" Block
CMI 48" Dryer—complete with motors, drives, belt, etc. screen cloth 1/16" opening, capacity 90 ton per hour.
1—Coppus Ventair Blower #24708.
Pulverizers: (American Pulverizers) 4—#305, Ser. #3218—AC3, Serial #1798, AC3B, Ser. #3127, WC-24, Ser. #3240.
5—8x6 Allis-Chalmers Centrifugal Pumps, complete with motors (4) breakers.
1—16x14 Allis-Chalmers Centrifugal Pump, complete with motor, starter, breakers.
1—Roberts & Schafer Eleptic Vibrator.
Consists of Belt & Chain Conveyors complete with motors, drives, 36" Belt also some 24x30" Belt.
1—Roberts & Schafer Air Drying Plant (specifications furnished on request)

**WELDERS**

3—Lincoln, 300 amp. M.G. Sets
2—Hobart 300 Amp. M.G. Sets
1—G.E. 400 amp. M.G. Set
4—Guyan 200 amp. Resistance Welders

**AUTOMATIC RECLOSING BREAKERS**

4—1600 amp. I.T.E. Modern with reverse current relay.

**AIRDOX EQUIPMENT**

5—Armstrong 60 H.P., AC 440 Volt Compressors
5—Armstrong Coal Breakers, Model EB-301.
5—G. E. Motors 60 H.P. Type K, Frame 504, 220/440 Volt AC, 1180 RPM.
Auxilary equipment and controls complete with 16,100 feet of Airdox Pipe.

**PORTAFEEDER**

1—Nolar Portafeeder.

**COAL DRILLS**

5—Manson Trucks—10 H.P., DC Tram Motors on 4, 7½ H.P. DC Tram Motors on 1, Joy 9 J Motor with Reduction on 1. Each drill truck has 2 drill arms with 2 Chicago Pneumatic 580 Drills 7½ H.P., DC.
3—Manson Track Trucks, each truck with 2 drill arms & 2,580 Drills.
2—Manson Track Trucks, without drills.
9—Dooley Rubber Tired Drill Trucks, equipped with two arms and two 580 drill motors.

**ROOF DRILLS**

1—Joy RBD-7 with 15 HP Reliance Permissible DC and mounted on Manson with 7½ H.P. Westinghouse on Rubber.
1—Jeffrey 56 R.D. with 15 H.P. Motor DC, arm is mounted on Manson Track Truck.
1—Dooley (Rubber Tired) Drill Truck, equipped with Vertical Drilling 580 Drill Motors.

**ROCK DUSTERS**

1—American Mine Door Road Cleaner
2—MSA Rock Dusters, 25 H.P. Track
3—MSA Bantam Rock Dusters, 2 H.P.

**TRUCKS**

4—(Shop Built) Mobile Repair Trucks
4—Personnel Jeeps, 42" Track Gauge.

**FANS**

1—Jeffrey Aerodyne Fan, Serial No. 8687 complete with G. E. 100 H.P. 440 Volt AC Motor and Auxiliary Ford Industrial Power Unit gasoline driven.
1—4 ft. Jeffrey Aerodyne Fan complete with 60 H.P. 220/440 Volt AC Motor and Auxiliary Ford Industrial Power Unit gasoline driven, complete with all necessary equipment and controls.

**TRANSFORMERS**

3—2400/4160 Y, 240-480 Volts, 100 KVA General Electric Single Phase Transformers.
3—2400/4160 Y, 240-480 Volts, 333 KVA General Electric Single Phase Transformers.
3—2300/4160 Y, 230-115 Volts, 200 KVA General Electric Single Phase Transformers.
3—2300/115/230 Volt, 15 KVA General Electric Single Phase Transformers.
3—50 KVA, 2300/4160 Y, 240/480 Volt General Electric Single Phase Transformers.

**SUPPLY HOUSE**

Complete inventory of new parts for 10SC, 10RU and 11BU Joy Equipment plus cable, tools, hardware, etc. for operation of mine.

**BATHHOUSE EQUIPMENT**

355—Baskets with Chains, 20 shower heads and complete equipment for operation of bathhouse.

**LAMP HOUSE**

360—R4 Cap Lamps complete with necessary charging equipment.
25—Flame Safety Lamps

**MOBILE EQUIPMENT**

1—Koehring Heavy Duty Crane—C5521.
1—Shovel Dipper Stock for same—Size 301, Serial No. 61, Length 16 feet—¾ yard dipper
1—Haiss Field Loader, Model 75WSBC, Serial No. 726, 11'6" Conveyor, Serial No. K8644.
1—International 1950 Flat Bed Truck Tandem with steel bed and wench, Ser. #3438, 3 axles, weight 18,500 lbs.
1—Haugh Pay Loader, Model HF and HFH, Serial No. 81221.
1—Allis Chalmers Tractor HD9-B27
1—Allis Chalmers Tractor Hi Lift, Model HD5, Model #24-27482, Serial No. 22246.
1—Caterpillar Tractor D6, 60" Gauge, Serial No. 5R4778.
1—Whiting Track Mobile, Serial #TM-209.
1—Roller—W. M. Bros. Boiler Mfg. Co., Model 678, Ser. #RR-2734, weight 3950 lbs.

**COMPLETE SHOP AND OFFICE EQUIPMENT**
**STATIONARY MOTORS**

AC and DC Motors ranging from 1 to 300 H.P.

**GENERAL MISCELLANEOUS**

Hundreds of other items such as pump, motors, armatures, locomotive trucks, wheel units, hydraulic pumps, conveyor chains, cat chains, tipple drag lines too numerous to list.

# MOUNTAIN STATE EQUIPMENT COMPANY

**Box 1050, Beckley, West Virginia** **Phone CLifford 3-7383**

**J. J. MAHONEY**
**Res. Phone CLifford 3-6804, Beckley**

**WILLIAM R. MONK**
**Res. Phone CLifford 3-6907, Beckley**

**R. E. KAMM**
**Res. Phone 4281, Summersville**

# ELECTRIC AND MACHINE SUPPLY COMPANY

## Largest Supplier of the Best Rebuilt Mining Equipment

### CONTINUOUS MINERS

1—3 JCM Joy Continuous Miner, 250 V., D.C., Excellent Condition
1—Lee Norse Jr. Continuous Miner, 250 V., D.C.

### CUTTING MACHINES

7—12RB Joy Cutting Machines, 250 V. D.C. Permissible, Dual Wheels, Bug Dusters, 9' Bar, Excellent Condition
5—11RU Joy Cutting Machines, 250 V. D.C., Permissible, Bug Dusters, one completely rebuilt
1—70URB Jeffrey Cutting Machine, 250 V. D.C., Excellent Condition
1—29U Jeffrey Cutting Machine, 220/440 V. A.C., Rebuilt
16—512 Goodman Cutting Machines, 250 V. D.C., Hydraulically or Manually Controlled
2—512 Goodman Cutting Machines, 220/440 V. A.C.
1—824 Goodman Slabber, 250 V. D.C.
50—35B and 35BB Jeffrey Cutting Machines, A.C. and D.C.
2—35L Cutting Machines
6—7AU Sullivan Cutting Machines, 250 V. D.C.
5—7B Sullivan Cutting Machines, 250 V. D.C.
16—11B Sullivan Cutting Machines, 35 & 50 h.p., 250 V. D.C.
19—12AB, 12AA and 112AA Goodman Cutting Machines, 250 V. D.C.
9—212AA Baby Goodman Cutting Machines, 250 V. D.C.

### BELT CONVEYORS

1—36" Joy Model "C" Belt Conveyor, 1,080' centers
9—MTB 30 Joy Tandem Belt Conveyors, 1,000' centers, 25, 40 & 50 h.p., one with Scandura Flame Proof Belting
860'—48" Link Belt Conveyor Structure
1—30" 97HC Goodman Tandem Belt Conveyor Drive
1—30" Shop Constructed Belt Conveyor Drive
288'—30" Barber Greene Belt Conveyor Structure
8,760—26" Joy Model "C" Structure
18—26" Conveyor Drives, various makes

### LOADING MACHINES

3—11BU Joy Loaders, 250 V. D.C.
5—8BU Joy Loaders, A.C. & D.C.
4—14BU-7RAE Joy Loaders, 250 V. D.C.
1—14BU-7BE Joy Loader, 250 V. D.C.
4—14BU-3PE Joy Loaders, 250 V. D.C.
7—14BU-2E Joy Loaders, 250 V. D.C., 28" O.H.
3—12BU-9E Joy Loaders, 250 V. D.C., rebuilt
5—20BU Joy Loaders, 250 V. D.C., Permissible
1—Whaley #3 Loading Machine, 42" t.g., Permissible, 3 years old, Excellent condition
1—360 Goodman Loader, on rubber, 250 V. D.C.
5—Long 88 Pig Loaders, 250 V. D.C.
1—24BB Clarkson Loader, 250 V. D.C.

### SHUTTLE CARS

10—60E-10 Joy Shuttle Cars, w/Elevators, matched pairs, 250 V. D.C.
10—42E Joy Shuttle Cars, 250 V. D.C.
5—5SC Joy Shuttle Cars, w/Elevators, 250 V. D.C.
20—6SC Joy Shuttle Cars, matched pairs, 250 V. D.C.
4—8SC Joy Shuttle Cars, Elevating Discharge Permissible Plates, Excellent Condition, 250 V. D.C.
21—32E-10 & 32E-16 Joy Shuttle Cars, Excellent condition, 250 V. D.C.
2—MT66-A45 Jeffrey Shuttle Cars, 250 V. D.C., matched pair, Excellent Condition

### MISCELLANEOUS TRACKLESS EQUIPM'T

1—WK-83R Joy Compressor, 240 cu. ft.
1—WL-82 Joy Compressor, 125 cu. ft.
7—T2-5AE & T2-2E Joy Machine Trucks
2—T1-4G Joy Machine Trucks, 220 V. A.C.
1—Lot 9J, 10J, 23J & 24J Motors

### PREPARATION EQUIPMENT

1—4 Cell Jeffrey Baum Jig Washer, complete, 300 t.p.h. capacity
1—Simon Carver Heavy Duty 2 Compartment Baum Jig, 400 t.p.h. capacity
1—Daniels Heavy Media Washer
1—48" CMI Centrifugal Dryer, Excellent
1—Heat Dryer, complete
1—36" x 130' Hot Material Handling Belt, Excellent
4—7' x 15' Single Deck Diester tables
1—36" x 36" Jeffrey Single Roll Crusher
1—36" x 33" Marion Double Roll Primary Crusher
1—30" x 36" Jeffrey Double Roll Crusher, Like New
1—30" x 30" Link Belt Double Roll Crusher
1—24" x 50" Pa. Single Roll Crusher
2—24" x 24" Jeffrey Single Roll Crushers
1—2' x 4' Williams Pulverizer
1—18" x 24" McClanahan Stone Single Roll Crusher
1—18" x 12" Jeffrey Swing Hammer Pulverizer
1—6' x 16' Allis Chalmers Double Deck Low Head Vibrator
1—6' x 14' Single Deck Allis Chalmers Low Head Vibrator, Like New
1—5' x 16' Triple Deck Allis Chalmers Ripl-Flo Vibrator, Like New
1—5' x 16' Single Deck Allis Chalmers Low Head Vibrator, Like New
2—5' x 12' Allis Chalmers Single Deck Low Head Vibrators
1—5' x 12' Allis Chalmers Ripl-Flo Double Deck Vibrator
1—5' x 10' Double Deck Robbins-Gyro Vibrator, Like New
1—4' x 12' Hewitt Robbins Vibrex Screen, Triple Deck
1—4' x 10' Selectro Double Deck Vibrator
5—4' x 7' Jeffrey Traylor Double Deck Vibrators
2—4' x 7' Jeffrey Traylor Single Deck Vibrators
1—3' x 14' Single Deck Gyro Vibrator
2—3' x 8' Low Head Vibrators
1—30" x 72" Jeffrey Traylor Double Deck Vibrator
1—2' x 5' Lecco Single Deck Vibrator
1—2' x 5' Selector Double Deck Vibrator
9—24" x 90" Jeffrey Traylor Vibrators, w/M.G. Sets
2—Magnetic Separators, Complete
1—Set Jeffrey Dewatering Screens
14—Scraper Conveyors of various sizes
14—Drag Conveyors of various sizes
1—970' Jeffrey Rope & Button Conveyor
13—Boom Hoists from 1 ton to 5 ton

We can construct loading booms and tipple belts in any size

### CHAIN & SHAKER CONVEYORS

20" Joy Chain Conveyors, A.C. & D.C., Permissible
15" Joy Chain Conveyors, A.C. & D.C., Permissible
15" Long Chain Conveyors with 400 DBH Mobile Heads or Stationary Drives, A.C. & D.C.
12" & 15" Jeffrey Chain Conveyors
12" Goodman Chain Conveyors
PT12 Long Piggyback Conveyors
PT12-B Long Piggyback Conveyors
Goodman G12½, G15 & G20 Shaker Conveyor Drives
Joy Ladel UN17 Shaker Conveyor Drives
Goodman Power Duckbill & Duckbill Hoists

### LOCOMOTIVES

4—20 Ton Jeffrey MH88 Locomotives, 42" & 48" t.g.
1—15 Ton HM828 G.E. Locomotive, 90 h.p. units, 44" O.H., 48" t.g., Excellent
1—14 Ton MH110 Jeffrey, 42" t.g.
8—13 Ton Locomotives, 250 V., any gauge
1—12 Ton 29B Goodman Locomotives, 40" O.H.
11—10 Ton Locomotives, 250 V., any guage
21—8 Ton Locomotives, 250 V., any gauge
8—7 Ton Atlas Battery Locomotives
1—6 Ton Battery Locomotive, New
30—6 Ton Locomotives, any gauge
3—6 Ton Jeffrey MH150 Locomotives
16—6 Ton MH88 Jeffrey Locomotives
10—5 Ton Locomotives, 250 V.
18—4 Ton Locomotives, 250 V., any gauge
1—4 Ton G.E. Battery Locomotive
2—4 Ton Mancha Battery Locomotives
1—4 Ton G.E. Battery Locomotive

### SUB STATIONS & TRANSFORMERS

1—Westinghouse A.C. Sub Station, 4500 KVA, 6900/2300, complete w/boards, Excellent Condition
4—300KW M.G. Sets
5—200KW M.G. Sets
4—200 KW, HCC-6-1200 G.E. Rotary Converters, Automatic
5—150KW G.E. Rotary Converters, w/Transformers
1—150KW Westinghouse Rotary Converter, Completely Automatic
19—150KW M.G. Sets of various makes and voltages
2—100KW M.G. Sets
1—100KVA Gasoline Alternator Unit
1—50KW M.G. Set, 125 V. D.C., 1200 rpm
2—Armatures for 200 KW Rotary G.E., type HCC
2—600 & 800 Auto Transformers
218—Transformers from 1½KVA to 800KVA
1—45KVA, A.C. Alternator, 220/440 V., Like New

### MINE CARS

90—36" t.g. Drop Bottom Cars
155—42" t.g. End Dump Cars, various makes
260—42" t.g. S. D. Drop Bottom Mine Cars
45—42" t.g. A.C.F. Drop Bottom Cars
22—44" t.g. Drop Bottom Cars, 10 Ton
130—44" t.g. Drop Bottom Cars, various sizes
333—44" t.g. End Dump Cars, various sizes
327—48" t.g. S. D. Drop Bottom Cars
259—48" t.g. A.C.F. Drop Bottom Cars
2—56½" t.g., 3 Ton, 4 Wheel Push Trucks (NEW)

### RAIL AND WIRE

1,455—Tons 30, 40, 45, 56, 60, 65, 70, 80, 90 & 100 lb. Relaying Rail
325'—2,000,000 CM Bare Copper Feeder Cable
550'—1,000,000 CM Insulated Aluminum
650'—1,000,000 CM Bare Copper Feeder Cable
500'—350,000 CM Copper Feeder Cable, Insulated
2,000'—2/0 Stranded Copper, Bare
36,670'—2/0 Solid Copper Highline Wire
47,000'—1/0 Solid Copper Highline Wire
10,435'—#1 Solid Copper Highline Wire
10,945'—#2 Solid Copper Highline Wire
442'—#4 Solid Copper Highline Wire
3,700'—#6 Solid Copper Highline Wire
5,825'—4/0 Fig 8 Trolley Wire
56,000'—6/0 Trolley Wire
1,600'—9 Section Trolley Wire
5,000'—2/0, 3 Cond. Anhydrex & Lead Covered Transmission Cable
10,000'—#2, 3 Cond. Lead Covered Cable, 5,000 V.
6,000'—#1, 3 Cond. Lead Covered Cable, 5,000 V.
2,500'—1¼" Steel Cable, New
600'—1⅛" Steel Cable, New

Several thousand feet #2, #3 and #4 approved type machine cable.

### MISCELLANEOUS

1—Canton Track Cleaner, Excellent
19—HKL, HKG, HKD, HKC, HL & CH Brown Fayre & Sullivan Hoists
50—Air Compressors of various sizes
57—Auto Starters from 3 h.p. to 100 h.p.
84—Hoists from 1½ h.p. to 800 h.p.
13—Shop Constructed Jeeps, track mounted
115—Pumps from ¾" to 4500 GPM
2—RBD30 C.P. Roof Drills
90—Coal Drills, various makes sizes
1—330 GPM 6" Pomona Deep Well Pump
1—14" Centrifugal Slurry Pump
44,357'—Pipe: Galvanized, Plastic & Cast Iron
45—Room Blowers, Brown Fayre & Jeffrey
31—Mine Fans from 30" to 9' Hi Pressure
17—Battery Chargers, various voltages
12—Rock Dusters up to 30 h.p.
5—Phillips Machine & Shuttle Car Carriers, 36" to 48" t.g.
1—42 Ton Richards Truck Scale, 10' x 25' Deck
693—Stationary Motors—½ to 800 h.p., A.C. & D.C. (List of motors available upon request)

We have thousands of dollars worth of parts for the equipment listed.

*ALL INQUIRIES WILL BE ANSWERED PROMPTLY—Call, Write or Wire us, day or night*

**PHONE EITHER OF OUR LOCATIONS FOR FAST RELIABLE SERVICE**

**WHITESBURG, KENTUCKY**
BOX #610, Ph. #2223
NIGHT PHONES—2234 or 2347

**CLARKSBURG, WEST VIRGINIA**
BOX #227, Ph. #MA 3-0253
NIGHT PHONES—VI 2-2776 or MA 2-6338

**BILL CONLEY • MELVIN ADAMS**
**LEONARD NEASE • JACK FAIRCHILD**

**HANK UBBING**
**GORDON STAFFORD**

# —ADVERTISERS IN THIS ISSUE—

***Indicates more product information may be found in company advertising appearing in COAL AGE 1960 July Mining Guidebook and Buying Directory Issue. Check your Guidebook index.**


*Allegheny Ludlum Steel Corp. ..... 2
Allis Chalmers ..... 51
*Alloy Rods Co. ..... 131
*American Biltrite Rubber Co. Boston Woven Hose & Rubber Div. .. 99
*American Pulverizer Co. ..... 50
American Steel & Wire Div. United States Steel Corp. ..... 47, 54-55
Austin Powder Co. ..... 37

*Bethlehem Steel Co. ..... 38, 91, 127, 143
*Bird Machine Co. ..... 4
Bucyrus-Erie Co. ..... 82-83

*Caterpillar Tractor Co. ..... 12, 29, 152
Cincinnati Mine Machinery Co. ..... 119

*Denver Equipment Co. ..... 57

Eaton Manufacturing Co. ..... 27
Ensign-Bickford Co. ..... 68
Ensign Electric & Manufacturing Co. .... 142
Euclid Div. General Motors ..... 103

*Fairmont Machinery Co. ..... Second Cover
*Falk Corp. ..... 31
*Federal Mogul Service Div. Federal-Mogul-Bower Bearings Inc. Third Cover
*Firestone Tire & Rubber Co. ..... 129

Galis Electric & Machine Co. ..... 6
General Splice Co. ..... 100
General Tire & Rubber Co. ..... 19
*Goodman Manufacturing Co. ..... 64-65
Goodrich Aviation Products B. F. ..... 22
*Goodrich Industrial Products Co. B. F. 1

*Hendrick Manufacturing Co. ..... 3
Hendrix Manufacturing Co. ..... 18
*Hewitt-Robins ..... 123
Heyl & Patterson Inc. ..... 132

*International Harvester Co. ..... 24-25
International Salt Co. Inc. ..... 40

*Jeffrey Manufacturing Co. ..... 16-17, 80-81
*Joy Manufacturing Co. ..... 56, 108-109

*Kennametal Inc. ..... 13
Koehring Co. ..... 66-67

*Lee-Norse Co. ..... 48-49
*LeRoi Div. Westinghouse Air Brake Co. 113
*Lima Works, Construction Equipment Div. Baldwin-Lima-Hamilton Corp. ..... 121
*Link-Belt Co. ..... Fourth Cover, 15
*Ludlow-Saylor Wire Cloth Co. ..... 53

*Macwhyte Co. ..... 101
Marietta Concrete Div. American Marietta Co. ..... 46
*McNally Pittsburg Manufacturing Co. 33, 34-35, 36, 130
*Metallurgical Products Div. General Electric Co. ..... 136, 137
*Mine Safety Appliances Co. ..... 41
*Mine & Smelter Supply Co. ..... 95
Morton Salt Co. ..... 23

*National Mine Service Co. ..... 8
*National Tube Div. United States Steel Corp. ..... 135
*Nolan Co. ..... 140

*Ohio Brass Co. ..... 39, 58
Okonite Co. ..... 138

Pattin Manufacturing Co. ..... 128
*Porter Co. Inc. H. K. Leschen Wire Rope Div. ..... 46, 132, 144
Thermoid Div. ..... 133
*Post-Glover Electric Co. ..... 63

Republic Steel Corp. ..... 20-21
*Roberts & Schaefer Co. ..... 139
*John A. Roebling's Sons Div. The Colorado Fuel & Iron Corp. ..... 97

Searchlight Section ..... 145-150
Simplex Wire & Cable Co. ..... 42-43

SKF Industries Inc. ..... 102
Spencer Chemical Co. ..... 125
*Stamler Corp. W. R. ..... 52
Stephens-Adamson Manufacturing Co. Engineering Div. ..... 14

Timken Roller Bearing Co. ..... 59

*United States Rubber Co. (Mechanical Goods Div.) ..... 10

*Victaulic Co. of America ..... 62

*Western Machinery Co. ..... 117
*Westinghouse Electric Corp. ... 44-45, 60-61
Wickwire Spencer Steel Div. Colorado Fuel & Iron Corp. ..... 86-87


CLASSIFIED ADVERTISING
F. J. Eberle, Business Mgr.


PROFESSIONAL SERVICES ..... 145
EMPLOYMENT OPPORTUNITIES ... 145
EQUIPMENT (Used or Surplus New) For Sale ..... 145-150



**ADVERTISING SALES STAFF**

**Atlanta 3** ..... Wm. O. Crank, 1301 Rhodes-Haverty Bldg., Jackson 3-6951

**Chicago 11** ..... C. H. Chase, F. W. Roets, 520 N. Michigan Ave., Mohawk 4-5800

**Cleveland 13** ..... W. W. Forysink, 55 Public Square, Superior 1-7000

**Dallas 1** ..... John Grant, 1712 Commerce St., Riverside 7-5117

**Denver 2** .... J. W. Patten, Tower Building, 1700 Broadway, ALpine 5-2981

**Los Angeles 17** .... P. Carberry, 1125 W. 6th St., Madison 6-9351

**New York 36** .. H. C. Chellson, B. Peckham, 500 5th Ave., Oxford 5-5959

**Pittsburgh 22** ..... Wm. H. H. Ginder, 4 Gateway Center, EXpress 1-1314

**Philadelphia 3** .. J. B. Lewis, 6 Penn Center Plaza, Philadelphia 3, Locust 8-4330

**St. Louis 8** ..... F. W. Roets, Continental Bldg., 3615 Olive St., Jefferson 5-4867

**San Francisco 4** .... J. W. Otterson, 68 Post St., Douglas 2-4600

**Houston 25, Texas** ..... F. B. Holland, Prudential Bldg., Room W-724, Holcombe Blvd., JAckson 6-1281

**Europe:**

**United Kingdom** ..... Norman Strick Hill House 95 Farringdon St., London E.C.4, Telephone CENTRAL 0911

**Austria, Germany, Netherlands** ..... Stanley Kimes, 85 Westendstrasse, Frankfurt/Main, Germany, Telephone: 772665

**Belgium, Luxemburg, France, Italy, Switzerland** ..... Michael R. Zeynel, 2 Place du Port, Geneva, Switzerland

# RIPPING WITH D9 ELIMINATES SHOOTING SANDSTONE AT THIS MODERN STRIP MINE

Expensive, time-consuming blasting of overburden is a thing of the past at the Harrisonville, Ohio, strip mine of the Swisher Coal Company. Caterpillar D9 Tractors with No. 9 Rippers loosen the sandstone overburden, which is then removed by a fleet of Cat DW21 Tractors, pushloaded by D9s.

In addition to saving the cost of shooting, the Pomeroy, Ohio, company saves the cost of reclamation. DW21s spread the excavated overburden over a large area, eliminate spoil banks entirely. The overburden averages 50 feet, covers a 2-foot coal seam. Production at the mine averages from 1000 to 1200 tons daily.

• D9 Tractors with No. 9 Rippers pay big dividends on modern stripping operations. (1) They save time and expense of blasting; (2) reduce wear and tear on loading equipment; (3) eliminate troublesome chunks; and (4) they are versatile—can build roads, clean up and handle other utility jobs.

And now the "King of the Crawlers" is even more rugged, more powerful! The new D9E has a massive new undercarriage that adds hours of life to running gear. A new Caterpillar-developed steel alloy strengthens links, shoes, rollers up to 40%. And the mighty new D9 packs 335 HP in its Turbocharged Engine.

Get the whole story from your Caterpillar Dealer. The new D9E is now available with revolutionary new torque divider power shift transmission. Ask for a demonstration on your stripping operation; you'll see more profit in every pass.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

**CATERPILLAR**

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NEW D9E—
BORN OF RESEARCH
PROVED IN THE FIELD

Better products, *faster*, from your National Seal distributor:

# National Oil Seals are the most positive protection against abrasive grit . . . the enemy of all bearings

**Regular replacements with National Seals keep high-production machines working profitably**

Special mining machines, as do all valuable production equipment in the coal industry, need the superior protection afforded by National Seals. The small investment required for regular replacements with National Seals pays off manyfold in the prevention of machine downtime and production loss.

National exclusive *Micro-Torc* leather, or *Syntech* rubber, seals offer quick availability in standard sizes for any application you may have.

Call in your National Seal distributor now. He's nearby and can specify the right seals for the job.

**NATIONAL OIL SEALS**

FEDERAL-MOGUL SERVICE

DIVISION OF FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 13, MICHIGAN

NATIONAL OIL SEALS

# coal comes clean

# economically

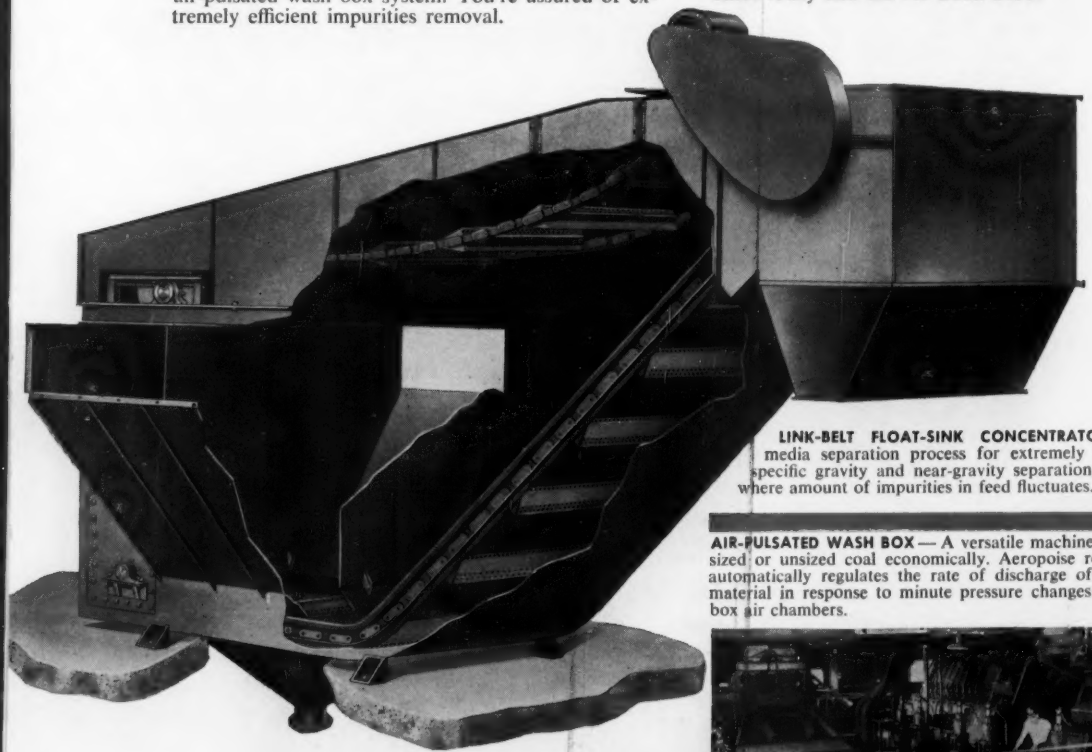
## with Link-Belt coal washers

BTU content goes up, ash percentages down—high-quality coal comes out uniformly clean and in a highly marketable condition.

And Link-Belt gives you your choice of two approaches to coal washing—heavy-media system or air-pulsated wash box system. You're assured of extremely efficient impurities removal.

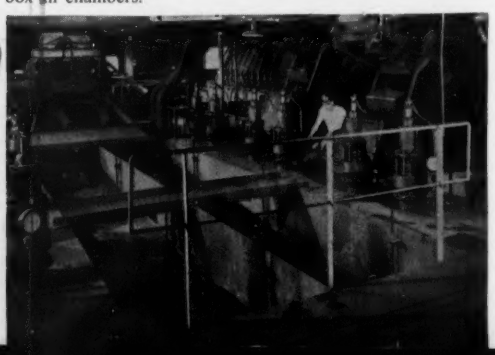
For high capacity cleaning of sized and unsized coal, or for high- and low-gravity separation, Link-Belt systems will meet your requirements economically. Our specialists will work with your engineers to choose the exact equipment. Call your Link-Belt office today and ask for Book 2655.

15,380



**LINK-BELT FLOAT-SINK CONCENTRATOR** — Heavy-media separation process for extremely high or low specific gravity and near-gravity separation, or for jobs where amount of impurities in feed fluctuates.

**AIR-PULSATED WASH BOX** — A versatile machine for cleaning sized or unsized coal economically. Aeropoise refuse control automatically regulates the rate of discharge of high-gravity material in response to minute pressure changes in the wash box air chambers.



**LINK-BELT**

**COAL PREPARATION AND HANDLING EQUIPMENT**

LINK-BELT COMPANY: Chicago 9, Birmingham 9, Cleveland 20, Denver 2, Detroit 4, Huntington 9, W. Va., Indianapolis 6, Kansas City 8, Mo., Louisville 8, Pittsburgh 13, Seattle 4, St. Louis 1, Canada, Scarboro (Toronto 13).